

STIC Search Report

EIC 1700

STIC Database Tracking Number: 168277

TO: Ben Sackey
Location: 5B31
Art Unit : 1626
October 26, 2005

Case Serial Number: 10/687411

From: Kathleen Fuller
Location: EIC 1700
REMSEN 4B28
Phone: 571/272-2505
Kathleen.Fuller@uspto.gov

Search Notes

SEARCH REQUEST FORM

Scientific and Technical Information Center

BEN SACKY

Requester's Full Name: 101687, 411 Examiner #: 73489 Date: 10/10/05
 Art Unit: 1626 Phone Number 302-0704 Serial Number: 101687, 411
 Mail Box and Bldg/Room Location: REM 5B31 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms; and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Catalysts
direct carbonylation phenolic

Title of Invention: H₂O resistant catalyst for the production of diaryl carbonate via

Inventors (please provide full names): Grigori Lev Solonovich et al

Earliest Priority Filing Date: 10/15/03

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

A method for making a diaryl carbonate, comprising contacting a reaction mixture of phenolic precursor with CO, O₂ in the presence of a carbonylation catalyst comprising Palladium or a compound

- (b) Co-catalyst e.g. phosphine, quinone, phenanthroline etc.
copper, titanium
- (c) a base
- (d) halide source
- (e) chemical additive comprising salt of magnesium or lithium or combination thereof.

STAFF USE ONLY

Searcher: K Fuller

Type of Search

Vendors and cost where applicable

Searcher Phone #: _____

NA Sequence (#) _____

STN _____

Searcher Location: _____

AA Sequence (#) _____

Dialog _____

Date Searcher Picked Up: _____

Structure (#) 4

Questel/Orbit _____

Date Completed: 10/26/05

Bibliographic _____

Dr.Link _____

Searcher Prep & Review Time: 30

Litigation _____

Lexis/Nexis _____

Clerical Prep Time: _____

Fulltext _____

Sequence Systems _____

Online Time: 36

Patent Family _____

WWW/Internet _____

Other _____

Other (specify) _____

=> FILE CASREA

FILE 'CASREACT' ENTERED AT 10:34:00 ON 26 OCT 2005
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT
COPYRIGHT (C) 2005 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE CONTENT:1840 - 23 Oct 2005 VOL 143 ISS 17

New CAS Information Use Policies, enter HELP USAGETERMS for details.

*
* CASREACT now has more than 9.2 million reactions
*

Some CASREACT records are derived from the ZIC/VINITI database (1974-1991) provided by InfoChem, INPI data prior to 1986, and Biotransformations database compiled under the direction of Professor Dr. Klaus Kieslich.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> D QUE L13

L5 STR = *New*

The diagram illustrates the conversion of a branched RRT structure to a linear PRO dact structure. On the left, an RRT structure is shown with carbons numbered 7 through 13. A hydroxyl group (OH) is at carbon 13. An oxygen atom is bonded to carbons 8 and 14, which are further bonded to carbons 7 and 12 respectively. Another oxygen atom is bonded to carbons 9 and 15, which are further bonded to carbons 10 and 11 respectively. In the center, the RRT structure is shown again with carbons 14 and 15 bonded to a single oxygen atom. To the right, the RRT structure is shown again with carbons 16 and 17 bonded to a single oxygen atom. An arrow points to the right, indicating the conversion to a linear PRO dact structure. The PRO dact structure has carbons numbered 1 through 5. It consists of a chain of four carbonyl groups (C=O) connected by oxygen atoms, with a terminal carbonyl group (C=O) attached to a carbon atom (Cb) labeled 1.

NODE ATTRIBUTES:

```
CONNECT IS E1 RC AT 14
CONNECT IS E1 RC AT 15
CONNECT IS E1 RC AT 16
CONNECT IS E1 RC AT 17
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 1
GGCAT IS UNS AT 5
DEFAULT ECLEVEL IS LIMITED
```

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 17

STEREO ATTRIBUTES: NONE

L7 51 SEA FILE=CASREACT SSS FUL L5 (59 REACTIONS)
L11 STR

RRT
Pd 1

NODE ATTRIBUTES:

NSPEC IS RC AT 1
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

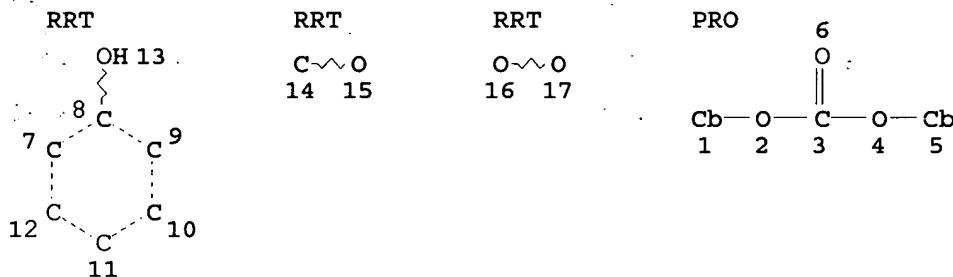
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 1

STEREO ATTRIBUTES: NONE

L13 0 SEA FILE=CASREACT SUB=L7 SSS FUL L11 (0 REACTIONS)

=> D QUE L8

L5 STR



NODE ATTRIBUTES:

CONNECT IS E1 RC AT 14
CONNECT IS E1 RC AT 15
CONNECT IS E1 RC AT 16
CONNECT IS E1 RC AT 17
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 1
GGCAT IS UNS AT 5
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 17

STEREO ATTRIBUTES: NONE

L7 51 SEA FILE=CASREACT SSS FUL L5 (59 REACTIONS)
L8 51 SEA FILE=CASREACT ABB=ON L7(L) ANY/CAT

=> D BIB ABS FHIT L8

51 CA references with any catalyst

L8 ANSWER 1 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 142:394138 CASREACT

TI Water-resistant carbonylation catalyst system for the production of diaryl carbonates via the direct carbonylation of phenolic compounds

IN Soloveichik, Grigorii Lev; Chuck, Timothy Leigh; Shalyaev, Kirill Vladimirovich; Pressman, Eric James; Bonitatebus, Peter John

applicants

PA General Electric Company, USA
 SO U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DT Patent

LA English

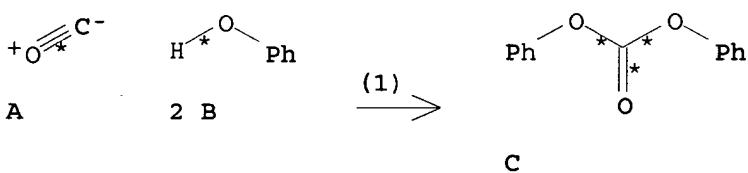
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005085656	A1	20050421	US 2003-687411	20031015
	WO 2005040089	A2	20050506	WO 2004-US30610	20040917
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG					

PRAI US 2003-687411 20031015

AB A method of increasing the amount of diaryl carbonates (e.g., di-Ph carbonate) produced per amount of catalyst consumed in a phenolic compound (e.g., phenol) carbonylation process is described. Phenolic compound carbonylation produces water as a reaction byproduct which reduces the turnover number (TON) of the catalyst. A mixture of a phenolic precursor, a base-containing catalyst and co-catalyst components and at least one chemical additive comprising a halide or hydroxide of alkali metal or alkaline earth metal when carbonylated together under specific conditions increases the TON and water resistivity of a palladium catalyst. The metal halide likely makes the catalyst less susceptible to degradation by water hence increasing the reaction yield per weight of catalyst consumed.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2, E 1310-73-2 NaOH, F 7647-15-6 NaBr
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 7440-50-8 Cu, 7440-32-6
 Ti, 7789-48-2 MgBr2
 SOL 143-24-8 Dimethoxytetraglycol
 CON SUBSTAGE(1) 10 minutes, room temperature -> 100 deg C, 1300 psi
 SUBSTAGE(2) 2 hours, 100 deg C, 1300 psi
 NTE high pressure, optimization study, Alternative preparations gave
 a lower Palladium turnover number

=> D BIB ABS FHIT L8 2-51

L8 ANSWER 2 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 142:137082 CASREACT
 TI Method of separating metallic catalyst constituents from reaction mixtures
 in the manufacture of aromatic carbonates
 IN Dahlmann, Marc; Fischer, Peter
 PA Germany
 SO U.S. Pat. Appl. Publ., 7 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 1

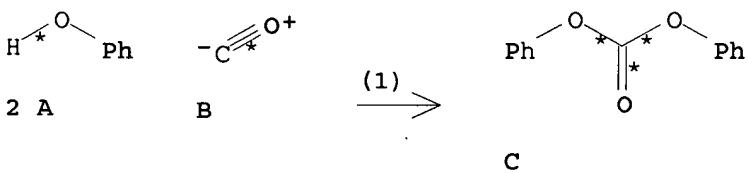
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005014965	A1	20050120	US 2004-891678	20040715
	DE 10332697	A1	20050203	DE 2003-10332697	20030718
	JP 2005047911	A2	20050224	JP 2004-209448	20040716

PRAI DE 2003-10332697 20030718

OS MARPAT 142:137082

AB A process for the preparation of an aromatic carbonate (e.g., di-Ph carbonate) is described which entails reacting in the presence of a catalyst system an aromatic hydroxy compound (e.g., phenol) with carbon monoxide and oxygen, and optionally in one or more solvents (e.g., chlorobenzene) to produce a liquid phase. At least a portion of the liquid phase is then subjected to a treatment to obtain a treated liquid phase. The treatment entails at least one of: (a) heating to a temperature that is at most mean reaction temperature without passing oxygen to the reaction mixture; (b) adding one or more protic compds. to the reaction mixture; and (c) passing through it one or more inert or reducing gases. Solid metallic catalyst constituents are then separated from the treated liquid phase by filtration.

RX(1) OF 1 2 A + B ==> C

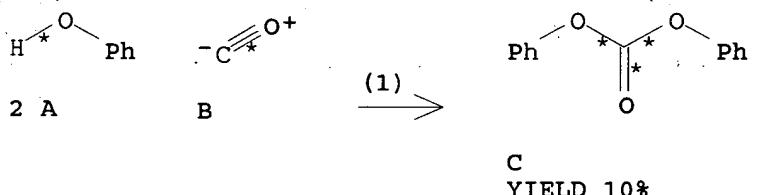


RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 13444-94-5 Palladium bromide (PdBr₂), 14284-89-0 Mn
 acetylacetone, 16909-23-2 1-Butanaminium, N,N,N-tributyl-,
 phenoxide, 1643-19-2 Bu₄N.Br
 SOL 108-90-7 PhCl
 CON 60 minutes, 90 deg C
 NTE optimization study, continuous synthesis, apparatus was used,
 other procedures gave lower catalyst recovery percentages

L8 ANSWER 3 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 141:412705 CASREACT
 TI Supported catalysts for direct synthesis of diphenyl carbonate through
 oxidative carbonylation of phenol
 AU Liu, Hong-wei; Zhou, Wei-qing; Zhao, Xin-qiang; Shao, Guo-gang; Wuang,

Yan-ji
 CS School of Chemical Engineering and Technology, Hebei University of
 Technology, Tianjin, 300130, Peop. Rep. China
 SO Shiyou Xuebao, Shiyou Jiagong (2004), 20(3), 49-53
 CODEN: SXSHEY; ISSN: 1001-8719
 PB Shiyou Xuebao, Shiyou Jiagong Bianjibu
 DT Journal
 LA Chinese
 AB A new supported catalyst PdCl₂-Cu(OAc)₂/HZSM-5 with high activity has been developed for synthesis of di-Ph carbonate through oxidative carbonylation of phenol. The optimum n(Cu)/n(Pd) molar ratio of the catalyst was 14.3 and the PdCl₂ loading was 1.5%. Solvents performed favorable effects on DPC yield with the increasing order of CH₃OH, C₆H₁₄, DMC, CH₂Cl₂. In addition, DMC may replace CH₂Cl₂ as the solvent for the reaction. The catalyst activity was greatly affected by the supports with the increasing following order of 5A mol. sieve, MgO, 4A mol. sieve, SiO₂, H β zeolite, γ -Al₂O₃, HZSM-5. PdCl₂/HZSM-5 and Cu(OAc)₂/HZSM-5 catalyst was prepared for studying the interaction between Pd and Cu and characterized by XPS.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O₂
 PRO C 102-09-0
 CAT 7647-10-1 PdCl₂, 142-71-2 Cu(OAc)₂
 SOL 75-09-2 CH₂Cl₂
 CON 8 hours, 80 deg C
 NTE optimization study, HZSM-5 used as catalyst

L8 ANSWER 4 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 141:279423 CASREACT
 TI Carbonylation process and catalysts for the production of a diaryl carbonates from phenols

IN Dahlmann, Marc; Fischer, Peter; Hansen, Sven-Michael; Reisinger, Claus-Peter

PA Bayer Materialscience Ag, Germany

SO Ger. Offen., 8 pp.

CODEN: GWXXBX

DT Patent

LA German

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10309954	A1	20040916	DE 2003-10309954	20030307
	EP 1460055	A1	20040922	EP 2004-4639	20040301
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK					

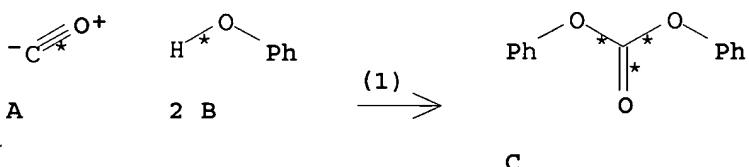
US 2004192953	A1	20040930	US 2004-791587	20040302
CN 1526694	A	20040908	CN 2004-10008006	20040305
JP 2004269530	A2	20040930	JP 2004-61940	20040305

PRAI DE 2003-10309954 20030307

OS MARPAT 141:279423

AB A procedure is described for the production of diaryl carbonates (e.g., di-Ph carbonate) by the direct carbonylation of phenols (e.g., phenol) in the presence of a catalyst system where the catalyst system is activated by thermal pretreatment in a sep. reaction apparatus

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 13444-94-5 Palladium bromide (PdBr₂), 14284-89-0 Mn acetylacetone, 16909-23-2 1-Butanaminium, N,N,N-tributyl-, phenoxide, 1643-19-2 Bu₄N.Br

SOL 108-90-7 PhCl

CON SUBSTAGE(1) 43 minutes, 50 deg C, 3 bar

SUBSTAGE(2) 127 minutes, 100 deg C

L8 ANSWER 5 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 141:245199 CASREACT

TI Study on direct synthesis of diphenyl carbonate with heterogeneous catalytic reaction (VI) Effect of Sn loading method and content on activity of Sn-Pd supported catalyst

AU Zhang, Guangxu; Wu, Yuanxin; Ma, Peisheng; Tian, Qifeng; Wu, Guangwen; Li, Dinghuo

CS Department of Chemical Engineering, Wuhan Institute of Chemical Technology, Wuhan, 430074, Peop. Rep. China

SO Chinese Journal of Chemical Engineering (2004), 12(2), 191-195
CODEN: CJCEEB; ISSN: 1004-9541

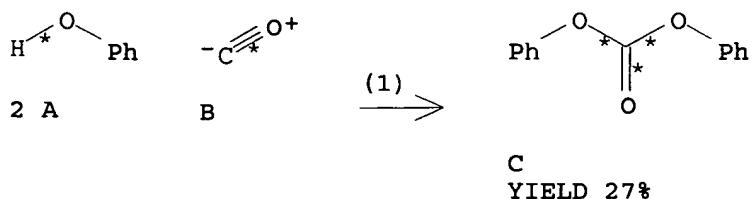
PB Chemical Industry Press

DT Journal

LA English

AB The mixed metal oxide LaxPbyMnzO was prepared by the sol-gel method and used as support for Sn-Pd catalyst. The catalyst in which Pd is the active component and Sn is co-catalyst was used in direct synthesis of di-Ph carbonate (DPC) in heterogeneous reaction medium in a pressurized reactor. The catalyst was characterized by x-ray diffraction, SEM, and TEM. When the co-active component Sn was added by co-calcination, the loading was 14.43% and the active component Pd was loaded by precipitation; the yield and selectivity of DPC were 26.78% and 99% resp.

RX(1) OF 1 2 A + B ==> C

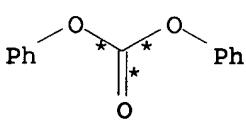
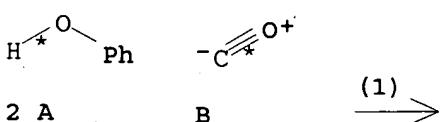


RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 1643-19-2 Bu4N.Br, E 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-05-3 Pd, 7440-31-5 Sn
 CON 4 hours, 60 deg C, 4.5 MPa
 NTE solid-supported catalyst on compd. metal oxide LaaPbbMncO prepd.
 and used; optimization study; optimized on catalyst prepn.
 method, tin loading content and reaction conditions

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 6 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 141:142108 CASREACT
 TI Synthesis of diphenyl carbonate by oxidative carbonylation of phenol with
 Pd/C catalyst
 AU Mei, Fuming; Li, Guangxing
 CS Dept. of Chemistry, Huazhong Univ. of Sci. & Tech., Wuhan, 430074, Peop.
 Rep. China
 SO Huazhong Keji Daxue Xuebao, Ziran Kexueban (2003), 31(9), 114-116
 CODEN: HKDXAT; ISSN: 1671-4512
 PB Huazhong Keji Daxue Xuebao Bianjibu
 DT Journal
 LA Chinese
 AB The preparation of di-Ph carbonate by oxidative carbonylation of PhOH using
 Pd/C as catalyst was studied. The effects of cocatalysts, such as
 Mn(OAc)2, benzoquinone and Bu4NBr, on the catalyst activity were determined.
 Under optimum conditions, the product yield reached 4.10% and the catalyst
 turn-over number was 162.6. The catalyst was reusable without loss of
 activity.

RX(1) OF 1 2 A + B ==> C



C
 YIELD 4%

RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-05-3 Pd, 638-38-0 Mn(OAc)₂, 106-51-4
 p-Benzoquinone, 1643-19-2 Bu4N.Br
 CON 4 hours, 100 deg C, 5.4 MPa
 NTE high pressure, yield depends on reaction conditions

L8 ANSWER 7 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 141:125366 CASREACT
 TI Two-component supported catalyst for synthesis of diphenyl carbonate and its preparation process
 IN Wang, Yanji; Liu, Hongwei; Zhao, Xi; Zhao, Xinqiang
 PA Hebei Polytechnics University, Peop. Rep. China
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 7 pp.
 CODEN: CNXXEV

DT Patent
 LA Chinese

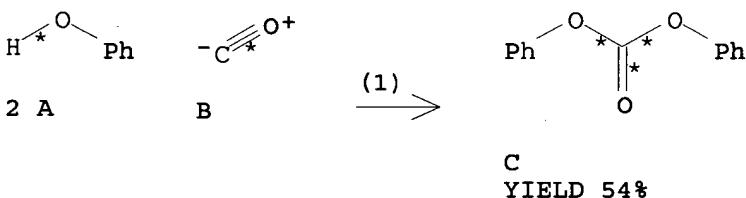
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1391986	A	20030122	CN 2002-125470	20020812
	CN 1133615	B	20040107		

PRAI CN 2002-125470 20020812

AB The title catalyst contains zeolite supported PdCl₂ and Cu(OAc)₂. The catalyst is prepared by the following steps of (1) grinding zeolite into 20-80 mesh size, calcining at 250-750°; (2) determining the water-absorption amount of calcined zeolite; (3) dissolving PdCl₂ and Cu(OAc)₂ into 2-5 v% aqueous NH₃ solution to obtain a impregnation solution; (4) isometrically impregnating the zeolite with the impregnation solution for 10-25 h; (5) drying at 35-70° for 3-10 h under vacuum; and (6) calcining at 250-750° for 3-10 h. The zeolite is selected from HZSM-5, H β , 4A, and 5A zeolites.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 123-31-9 Hydroquinone, 1643-19-2 Bu4N.Br, 7647-10-1
 PdCl₂, 142-71-2 Cu(OAc)₂
 SOL 75-09-2 CH₂Cl₂
 CON SUBSTAGE(1) room temperature -> 80 deg C
 SUBSTAGE(2) 8 hours, 80 deg C
 NTE alternative prepn. shown, Pd-Cu-HZSM-5 used as catalyst

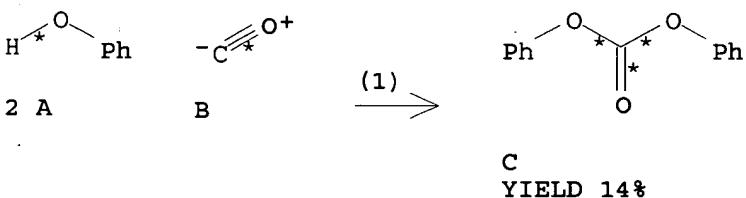
L8 ANSWER 8 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 141:125365 CASREACT
 TI Zeolite supported copper acetate catalyst for synthesis of diphenyl carbonate
 IN Wang, Yanji; Zhao, Xi; Liu, Hongwei; Zhao, Xinqiang
 PA Hebei Polytechnics University, Peop. Rep. China
 SO Faming Zhanli Shengqing Gongkai Shuomingshu, 7 pp.
 CODEN: CNXXEV
 DT Patent
 LA Chinese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1391985	A	20030122	CN 2002-125471	20020812
	CN 1133616	B	20040107		

PRAI CN 2002-125471 20020812

AB The title catalyst contains zeolite-supported Cu(OAc)₂ at ratio of 50-100:0.1-30. The catalyst is prepared by the following steps of (1) grinding zeolite into 20-80 mesh size, calcining at 250-750°; (2) determining the water-absorption amount of calcined zeolite; (3) dissolving Cu(OAc)₂ into 2-5% aqueous NH₃ solution to obtain a impregnation solution; (4) isometrically impregnating the zeolite with the impregnation solution for 10-25 h; (5) drying at 35-70° for 3-10 h under vacuum; and (6) calcining at 250-750° for 3-10 h. The zeolite is selected from HZSM-5, H β , 4A, and 5A zeolites.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 123-31-9 Hydroquinone, 1643-19-2 Bu4N.Br, 142-71-2
 Cu(OAc)₂
 SOL 75-09-2 CH₂Cl₂
 CON SUBSTAGE(1) room temperature -> 80 deg C
 SUBSTAGE(2) 8 hours, 80 deg C
 NTE alternative prepn. shown, Cu-HZSM-5 used as catalyst

L8 ANSWER 9 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 140:272666 CASREACT
 TI Non-halogen redox catalysis toward green processing
 AU Higashijima, Michio; Nagayama, Kazuhiro
 CS Homogeneous Catalysis Laboratory, Science and Technology Research Center, Mitsubishi Chemical Corporation, Aoba-ku, Yokohama, 227-8502, Japan
 SO Studies in Surface Science and Catalysis (2003), 145(Science and Technology in Catalysis 2002), 551-552
 CODEN: SSCTDM; ISSN: 0167-2991

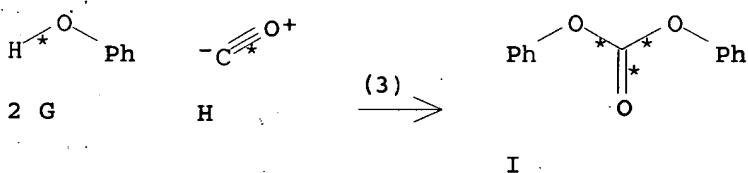
PB Elsevier Science B.V.

DT Journal

LA English

AB The oxidation of alkylaroma with ruthenium-substituted heteropolyanion and the oxidative carbonylation of phenol to di-Ph carbonate catalyzed by palladium/2-hydroxypyridine system are described. The Ru-substituted heteropolyanion is a notable example of a "green catalyst" in a non-halogen containing water solvent system. The Pd/2-PyOH catalyst system showed high activity as high as that of alternative Pd/co-catalyst systems with the addition of NR4Br in a large amount. Using this catalyst, the reaction proceeded fast enough under lower CO pressure. The activity of the catalyst was significantly affected by the partial oxygen pressure, indicating the reoxidn. of catalysts are the rate-determining step.

RX(3) OF 3 2 G + H ==> I



RX(3) RCT G 108-95-2, H 630-08-0

RGT C 7782-44-7 O2

PRO I 102-09-0

CAT 7440-05-3 Pd, 142-08-5 2-Pyridinone, 142-71-2

Cu(OAc)2, 537-00-8 Acetic acid, cerium(3+) salt, 64-19-7 AcOH

SOL 68-12-2 DMF

CON 0.5 hours, 120 deg C, 6 MPa

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 10 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 140:255279 CASREACT

TI Study on direct synthesis of diphenyl carbonate through heterogeneous catalysis. VII. Deactivation and regeneration of Pd-Sn catalyst

AU Zhang, Guangxu; Ma, Peisheng; Wu, Yuanxin; Wu, Guangwen; He, Fei; Li, Dinghuo; Wang, Cunwen

CS State Key Laboratory of C1 Chemistry and Technology, School of Chemical Engineering, Tianjin University, Tianjin, 200072, Peop. Rep. China

SO Cuihua Xuebao (2003), 24(11), 835-838

CODEN: THHPD3; ISSN: 0253-9837

PB Kexue Chubanshe

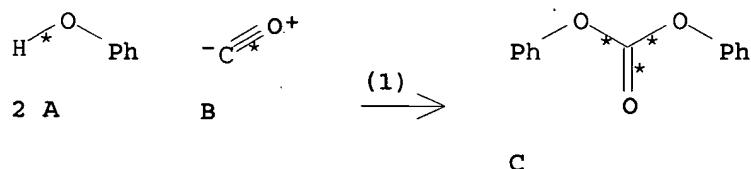
DT Journal

LA Chinese

AB In order to investigate the deactivation of Pd-Sn catalyst for direct synthesis of di-Ph carbonate via heterogeneous catalysis, the components in the washing solution of the regeneration catalyst was measured by GC-MS, and there appeared only two peaks representing phenol and solvent resp. The Pd contents in the fresh and the used catalysts were analyzed by ICP, and the loss of active component Pd of the used catalyst was less than 10%. The deactivated and the fresh catalyst samples were characterized by XPS, revealing that the Sn element migrated to the catalyst surface after reaction, but the content of carbon on the catalyst surface did not increase, the valences of active component Pd and co-active component Sn

remained unchanged and exhibited as +2 and +4 resp. Based on the above results, the main deactivation reason of the catalyst should be the serious adsorption of phenol on the catalyst and the migration of Sn element to the catalyst surface during the reaction. When acetone used as regeneration solvent (23.1%), solution temperature set to 60° and drying temperature set to 300 °C , the activity of regenerated catalyst was higher. In addition, the addition of promoter Ce could be helpful to the improvement of the catalyst life.

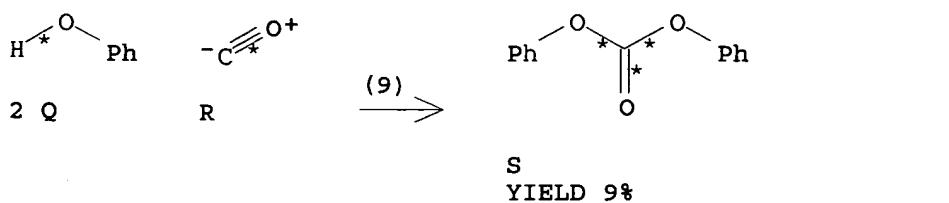
RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O₂, E 1643-19-2 Bu4N.Br
 PRO C 102-09-0
 CAT 37296-86-9 Lanthanum lead manganese oxide, 7440-05-3
 Pd, 7440-31-5 Sn
 SOL 75-09-2 CH₂Cl₂
 CON 4 hours, 60 deg C, 4.5 MPa
 NTE solid-supported catalyst, optimization study

L8 ANSWER 11 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 139:383004 CASREACT
 TI Oxidative carbonylation of phenol to diphenyl carbonate catalyzed by Pd-carbene complexes
 AU Okuyama, Ken-ichi; Sugiyama, Jun-ichi; Nagahata, Ritsuko; Asai, Michihiko; Ueda, Mitsuru; Takeuchi, Kazuhiko
 CS Research Center of Macromolecular Technology, National Institute of Advanced Industrial Science and Technology, Tsukuba, Ibaraki, 305-8565, Japan
 SO Journal of Molecular Catalysis A: Chemical (2003), 203(1-2), 21-27
 CODEN: JMCCF2; ISSN: 1381-1169
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Various Pd-carbene complexes with bis(heterocyclic carbene) ligands were prepared and investigated their catalytic activity for oxidative carbonylation of phenol with carbon monoxide to di-Ph carbonate (DPC). The catalyst system was composed of Pd complex, inorg. redox cocatalyst, organic redox cocatalyst, organic salt, and mol. sieve. The Pd-carbene complex systems PdBr₂(c1-tBu)/Ce(TMHD)₄ (TMHD: 2,2,6,6-tetramethyl-3,5-heptanedionate)/nBu₄NBr/hydroquinone showed approx. a double activity compared to a conventional PdBr₂ catalytic system without the use of ligands.

RX(9) OF 17 2 Q + R ==> S



RX (9)

STAGE(1)

RGT T 123-31-9 Hydroquinone, U 1643-19-2 Bu4N.Br
 CAT 142-71-2 Cu(OAc)₂, 615574-52-2 Palladium,
 dibromo[methylenebis(3-butyl-1H-imidazol-1-yl-2(3H)-
 ylidene)]-, (SP-4-2)-
 CON 70 hours, 2 deg C

STAGE(2)

RCT Q 108-95-2, R 630-08-0
 RGT V 7782-44-7 O₂
 SOL 75-09-2 CH₂Cl₂
 CON 3 hours, 100 deg C, 6e6 Pa

STAGE(3)

SOL 7732-18-5 Water

PRO S 102-09-0

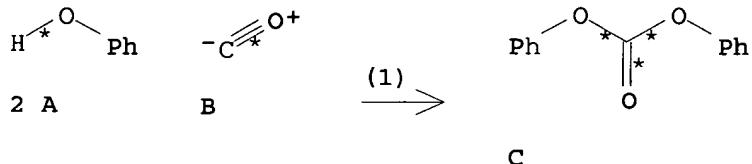
NTE high pressure

RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 12 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 139:278225 CASREACT
 TI Nature and role of active states of Pd and Cu in the oxidative
 carbonylation of phenols with Pd/C and cuprous oxide
 AU Kim, Won Bae; Park, Eun Duck; Lee, Chul Woo; Lee, Jae Sung
 CS Department of Chemical Engineering, Pohang University of Science and
 Technology (POSTECH), Hyoja-dong, Pohang, 790-784, S. Korea
 SO Journal of Catalysis (2003), 218(2), 334-347
 CODEN: JCTLA5; ISSN: 0021-9517
 PB Elsevier Science
 DT Journal
 LA English
 AB Active states of palladium and copper for the oxidative carbonylation of
 phenol and bisphenol-A were investigated using X-ray absorption near-edge
 structure (XANES) and extended X-ray absorption fine structure (EXAFS) for
 Pd and Cu K-edges. The initial states of Pd and Cu were carbon-supported
 metallic Pd and cuprous oxide, resp. During oxidative carbonylation,
 however, the metallic character of palladium was enhanced, as indicated by
 Pd K-edge XANES spectra taken before and after the reaction. Furthermore,
 Pd-Pd coordination number increased from ca. 6.0 to 11.0, as determined by the
 quant. EXAFS analyses of Pd K-edge. The initial crystalline cuprous oxide was
 converted by reaction with Bu₄NBr into an unusual linear cuprous dibromide
 complex stabilized by tetrabutylammonium cation. Qual. XANES and EXAFS
 analyses of Cu K-edge identified the structural and electronic
 configuration of the cuprous complex that was found to be the active main

catalyst. There was a direct correlation between the formation of the cuprous complex and the catalytic activity and selectivity. Based on these results, a possible catalytic reaction scheme was proposed for the oxidative carbonylation of phenols with the catalytic system of Pd/C, an inorg. cuprous compound and Bu₄NBr.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0

STAGE(1)

RGT D 1643-19-2 Bu₄N.Br, E 7782-44-7 O₂
 CAT 1317-39-1 Cu₂O, 7440-05-3 Pd, 106-51-4
 p-Benzoquinone
 SOL 109-99-9 THF
 CON SUBSTAGE(1) room temperature -> 373K
 SUBSTAGE(2) 4 hours, 373K

STAGE(2)

RGT F 7732-18-5 Water

PRO C 102-09-0

NTE optimization study

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

Li8 ANSWER 13 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 139:199090 CASREACT

TI Method and catalyst composition for producing aromatic carbonates using activating solvents

IN Soloveichik, Grigorii Lev

PA General Electric Company, USA

SO U.S. Pat. Appl. Publ., 7 pp.

CODEN: USXXCO

DT Patent

LA English

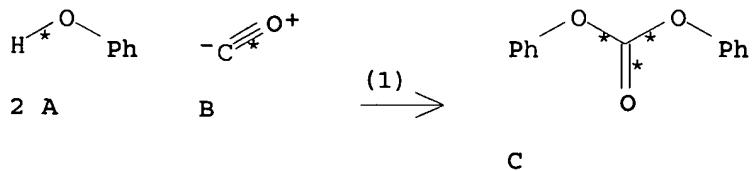
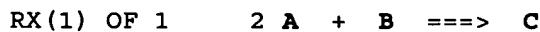
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003162652	A1	20030828	US 2002-683865	20020225
	US 6903049	B2	20050607		

PRAI US 2002-683865 20020225

AB The present disclosure is directed to a catalyst composition used in the production of aromatic carbonates, and in particular to a catalyst composition which comprises an activating solvent. In one embodiment the disclosure relates to a catalyst composition which comprises a combination of two activating solvents, a first activating solvent chosen for its coordinative properties, and a second activating solvent chosen for its dielec. constant properties. In alternative embodiments, the present disclosure also

pertains to a method for producing aromatic carbonates using the catalyst compns. disclosed herein.



RX(1) RCT A 108-95-2, B 630-08-0

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 14024-61-4 Pd acetylacetone, 56238-40-5 Titanium, oxo(2,4-pentanedionato-O,O')-, 7647-15-6 NaBr, 1317-36-8 PbO

SOL 143-24-8 Dimethoxytetraglycol, 126-33-0 Sulfolane

CON 2.5 hours, 100 deg C, 10.3 MPa

NTE optimization study, mol. sieves used

L8 ANSWER 14 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 139:38213 CASREACT

TI Effects of inorganic cocatalysts and initial states of Pd on the oxidative carbonylation of phenols over heterogeneous Pd/C

AU Kim, Won Bae; Park, Eun Duck; Lee, Jae Sung

CS School of Environmental Science and Engineering, Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, 790-784, S. Korea

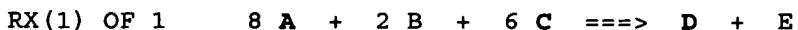
SO Applied Catalysis, A: General (2003), 242(2), 335-345
CODEN: ACAGE4; ISSN: 0926-860X

PB Elsevier Science B.V.

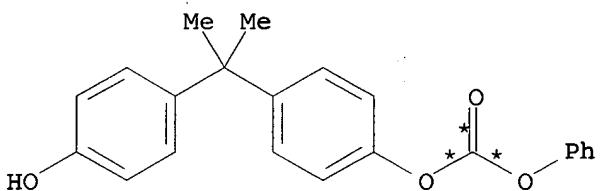
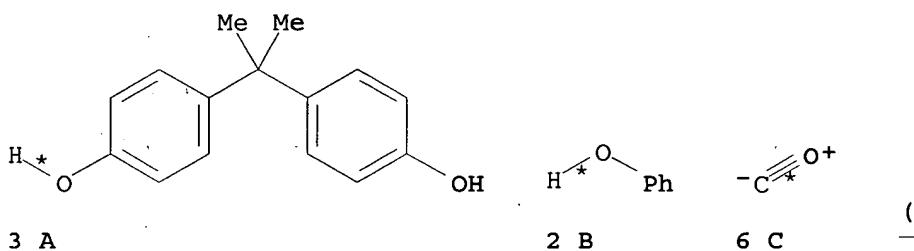
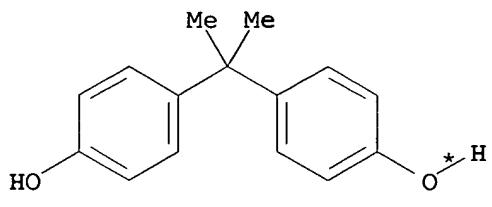
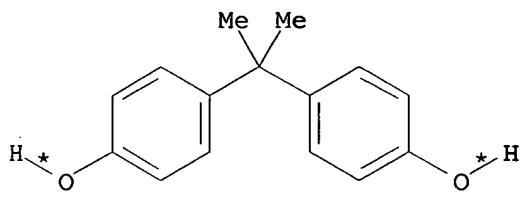
DT Journal

LA English

AB The effects of metal complexes of Ce, Co, Mn, and Cu and of the initial state of Pd with different particle size on the coupled oxidative carbonylation of bisphenol-A (BPA) and phenol over activated carbon-supported Pd were studied. In the presence of Ce(CH₃COO)₃ co-catalyst, homogeneous Pd(CH₃COO)₂ showed a better activity than Pd/C as the main catalyst. The Cu₂O co-catalyst was selected as best partner for Pd/C. The heterogeneous Pd/C-Cu₂O catalyst system showed superior activity vs. that of homogeneous catalyst systems such as Pd(CH₃COO)₂-Ce(CH₃COO)₃ or Pd(CH₃COO)₂-Cu₂O, as it provided increased conversion of bisphenol-A and selectivity toward the desired p-carboxylated oligomers, which are of interest as intermediates in phosgene-free production of polycarbonates. The active Pd phase is metallic Pd, as evidenced by the strong metallic character of Pd observed after the reaction, using x-ray absorption of near edge structure (XANES) of Pd K-edge. In Pd/C, the nature of metal and ligand of the inorg. cocatalyst significantly affected the catalyst activity and selectivity. However, the initial state of supported Pd showed negligible effects, although the metallic character of Pd varied drastically due to increasing Pd loadings or reduction temps.



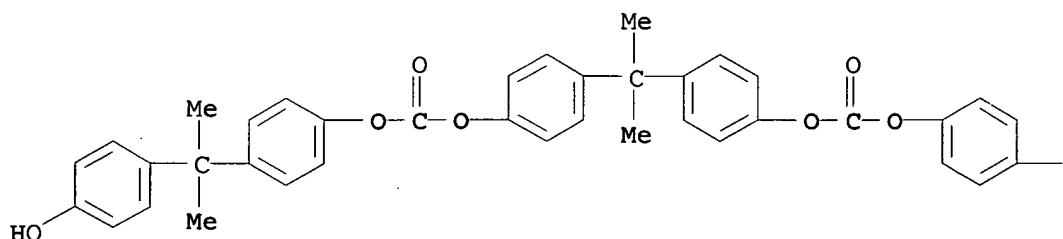
+ F + G



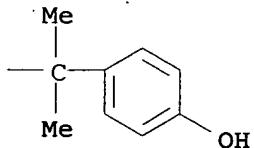
* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 1-A



PAGE 1-B



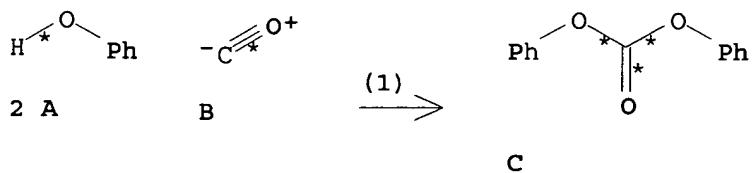
G

RX(1) RCT A 80-05-7, B 108-95-2, C 630-08-0
 RGT H 1643-19-2 Bu4N.Br, I 7782-44-7 O2
 PRO D 20218-73-9, E 34074-60-7, F 540536-58-1, G
 65559-16-2
 CAT 7440-05-3 Pd, 7440-44-0 Carbon, 1317-39-1 Cu2O,
 106-51-4 p-Benzoylquinone
 SOL 109-99-9 THF
 CON 4 hours, 373K, 10.5 MPa
 NTE percent conversion and product distribution depends on catalyst,
 optimization study, optimized on inorg. cocatalyst, palladium
 loading, temp.

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 15 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 138:320988 CASREACT
 TI A new heterogeneous catalyst for the oxidative carbonylation of phenol to
 diphenyl carbonate
 AU Linsen, Koen J. L.; Libens, Jo; Jacobs, Pierre A.
 CS Centre for Surface Chemistry and Catalysis, Faculty of Agricultural and
 Applied Biol. Sciences, Katholieke Universiteit Leuven, Louvain, Belg.
 SO Chemical Communications (Cambridge, United Kingdom) (2002), (22),
 2728-2729
 CODEN: CHCOFS; ISSN: 1359-7345
 PB Royal Society of Chemistry
 DT Journal
 LA English
 AB Using layered double hydroxides as a support, both the palladium catalyst
 and the cobalt co-catalyst are heterogenized and proven to form an
 acceptable catalytic system for the heterogeneous oxidative carbonylation
 of phenol to di-Ph carbonate.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 512785-43-2 Palladium, [(2,9-dimethyl-1,10-phenanthroline-4,7-diyl- κ N1, κ N10)bis[benzenesulfonat o]](2-)], 106-51-4 p-Benzoquinone, 1643-19-2 Bu4N.Br, 6667-75-0 Ethanaminium, N,N,N-triethyl-, (T-4)-tetrachlorocobaltate(2-) (2:1)
 CON 3 hours, 100 deg C, 5.5 bar
 NTE green chem.-cat.

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 16 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 138:136712 CASREACT
 TI Experimental method and system for conducting combinatorial high-throughput screening, and its application to a combinatorial study of cocatalysts and solvents in the production of diaryl carbonates by the palladium-catalyzed carbonylation of phenols
 IN Cawse, James Norman
 PA USA
 SO U.S. Pat. Appl. Publ., 12 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 1

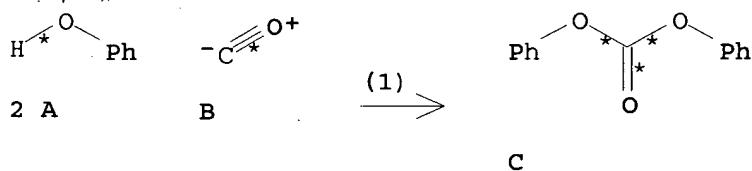
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003022234	A1	20030130	US 2001-681753	20010531

PRAI US 2001-681753 20010531

AB An exptl. design method, which is useful for combinatorial high-throughput screening (CHTS), is described. The methodol. is illustrated by application to a catalyzed reaction optimization problem. Briefly, the method entails iterative cycles of (1) evaluation of the probability of pos. interactions between the levels (values) of potentially interacting factors, (2) designing and performing CHTS expts. based on those probabilities, and (3) repeating the evaluation of probabilities of interaction based on the results, etc. More specifically, the method is as follows: (1) factors to be investigated are selected; (2) pos. interactions (high, medium, or low) between different individual levels (values) of the factors are estimated; (3) a CHTS experiment is carried out on the various levels of the factors; (4) the probabilities of pos. interactions are adjusted according to the results of the CHTS experiment. For example, the preparation of di-Ph carbonate by carbonylation of phenol, using a Pd acetylacetone catalyst and excess phenol as solvent, was studied. In particular, the 6 factors chosen for study were type and amount of (1) primary transition metal cocatalyst [Fr, Cu, Ni, Pb, Re (as acetylacetones)], (2) secondary metal cocatalyst [V, W, Ce, La, Sn (as acetylacetones)], and (3) cosolvent [HCONMe2 (DMF), MeCONMe2 (DMA), MeCONEt2 (DEA), THF (THF), diglyme (DGL)]. In a meeting between customers and investigators, a sym. matrix of estimated interactions was created for the 6 factors. High probability values (0.8) were assigned to self-interactions of each of the three type/amount pairs, i.e., primary cocatalyst with primary cocatalyst amount, etc. Medium (0.3) and low (0.1) probabilities were assigned to the remaining interactions. A full factorial experiment to test all two-factor interactions was generated by computer and used to program a robotic CHTS experiment. Carbonylation of phenol was thus carried out at 100° and 1500 psig under CO containing O2, in

the presence of Pd(acac)₂ as primary catalyst, and approx. 240 different combinations of cocatalysts, solvents, and their amts. Anal. of variance (ANOVA) of the results showed 3 very strong interactions and 1 moderately strong interaction. These were (1) primary cocatalyst type and secondary cocatalyst type; (2) primary cocatalyst type and amount; (3) secondary cocatalyst type and amount; and (4) secondary cocatalyst amount and cosolvent amount. The matrix of interaction probabilities was modified accordingly, increasing strong probabilities by 50% of distance to 1.0, increasing moderate probabilities by 25% of distance to 1.0, leaving weak probabilities unchanged, and decreasing non-interactive probabilities by 50% of distance to zero. A new CHTS experiment based on the strongest interactions was run, and ANOVA anal. indicated a statistically significant 3-way lead: high levels of Re in the presence of either La or Sn. The invention also includes a reactor and a programmed controller for effecting the method. Specifically claimed is a system for conducting the experiment. The system includes a reactor for effecting the combinatorial high throughput screening method as described, as well as a programmed controller that (1) stores the assigned probabilities for estimated interactions, and (2) adjusts these according to the exptl. results. The system can include dispensers and detectors.

RX(1) OF 2 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 14284-91-4 Rhenium,
 tris(2,4-pentanedionato- $\kappa\text{O},\kappa\text{O}'$)-, (OC-6-11)-,
 14284-88-9 Lanthanum, tris(2,4-pentanedionato- $\kappa\text{O},\kappa\text{O}'$)-, (OC-6-11)-
 SOL 127-19-5 AcNMe₂
 CON 100 deg C, 1500 psi
 NTE combinatorial, high pressure, optimization study, optimized on 2
 cocatalysts and solvent by combinatorial study of 2-way
 combinations of 10 metal cocatalysts and 5 solvents

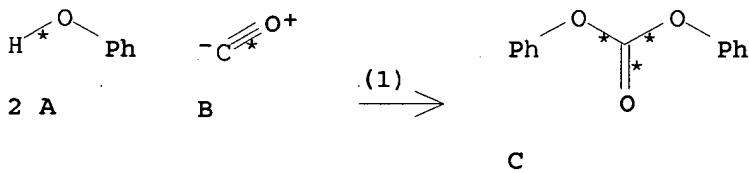
L8 ANSWER 17 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 138:106244 CASREACT
 TI Combinatorial experiment design method and system for high-throughput
 screening, and its application to a combinatorial study of cocatalysts in
 the production of diaryl carbonates by the palladium-catalyzed
 carbonylation of phenols
 IN Cawse, James Norman
 PA General Electric Co., USA
 SO U.S. Pat. Appl. Publ., 9 pp.
 CODEN: USXXCO
 DT Patent
 LA English
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2003013207	A1	20030116	US 2001-682029	20010711
US 6684161	B2	20040127		

PRAI US 2001-682029 20010711

AB A combinatorial exptl. design method, which is useful for high-throughput screening, is described. The methodol. is illustrated by application to a catalyst optimization problem. Briefly, the method entails running two combinatorial expts. and comparing the results to find the best common results. More specifically, a first exptl. space comprising levels of factors is designed according to an incomplete block design. Then, a second exptl. space comprising levels of factors is designed by random selection. Sep. combinatorial high-throughput screening expts. are effected on each exptl. space. Common best results are selected from the results of both expts. In t-design terminol. t-(v, k, λ) are studied, where t is the size of the target interaction subset (e.g., 3 for a 3-way interaction), v is the total number of levels (candidates), k is the block size (size of actual interaction subset), and λ is the replication (number of times a subset t appears in the total set of blocks). Preferred value ranges are t = 3-4, v = 14-26, k = 4-6, and λ = 1-2. For example, the preparation of di-Ph carbonate by carbonylation of phenol using a Pd catalyst and 3-metal combinations selected from 22 metal cocatalysts was studied (t = 3, v = 22). Instead of testing all 1540 possible 3-way combinations, an incomplete block (77 members) of 6-way combinations (k = 6), which included a single test (λ = 1) of all possible 3-way combinations, was designed. Carbonylation of phenol was thus carried out over 180 min at 100° and 1000 psi under CO containing 8% O₂, in the presence of Pd(acac)₂ as primary catalyst, hexamethylguanidinium bromide as anion cocatalyst, and 77 different combinations of 6 metal cocatalysts (as acac complexes or other unspecified derivs.). The experiment was then repeated, but with the identities of the 6 metals in the 77 combinations permuted randomly. Both expts. had 4 pos. outliers among 77 results, e.g., TiRuMnLaFeBi in run 1 (turnover number 2060) and BiCsTiRuInYb in run 2 (turnover number 1930). When the outliers were arrayed against each other (4+4 matrix), nine common 3-way combinations were identified and investigated. Among these, BiRuTi was selected and optimized to a turnover number exceeding 3000. The invention also includes a reactor and controller for effecting the method. Specifically claimed is a system for conducting the experiment. The system includes a reactor for effecting the combinatorial high throughput screening method as described, as well as a programmed controller that defines the two exptl. spaces as described.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O₂
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 7440-18-8 Ru, 7440-69-9
 Bi, 7440-32-6 Ti, 6926-43-8 Methanaminium, N-

[bis(dimethylamino)methylene]-N-methyl-, bromide
 CON 180 minutes, 100 deg C, 1000 psi
 NTE combinatorial, high pressure, optimization study, optimized on
 3-way cocatalyst by combinatorial study of 6-way combinations of
 22 metal cocatalysts

L8 ANSWER 18 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 137:384653 CASREACT

TI Preparation of diaryl carbonates

IN Tange, Shinya; Nagashima, Ryoichi; Yoshizato, Akinobu

PA Teijin Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

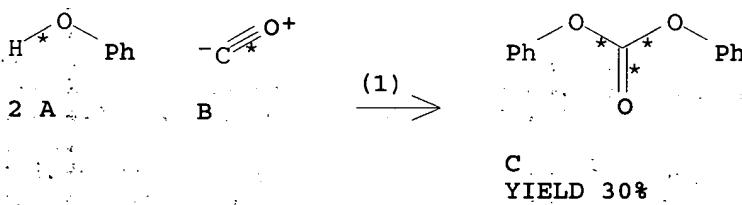
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002338523	A2	20021127	JP 2001-144322	20010515
PRAI JP 2001-144322		20010515		
OS MARPAT 137:384653				

AB The compds. ROCO₂R [R = (un)substituted C₆-15 aryl] are prepared by atomizing mixts. of ROH (R = same as above) and catalysts, introducing into a reactor, and oxidative carbonylating with gaseous mixts. of CO and O, wherein water is removed with inert substances by distillation. A mist containing 2 kg PhOH, Pd(OAc)₂ 1.8, Mn(OAc)₂ 2.75, Bu₄NBr 50, (Bu₄N)₄SiWMo₁₁O₄₀ 6.75, and THF 500 g was treated with a gaseous mixture containing CO and O at 80° to give 30.2% di-Ph carbonate.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 3375-31-3 Pd(OAc)₂, 638-38-0 Mn(OAc)₂, 1643-19-2
 Bu₄N.Br, 77431-08-4 1-Butanaminium, N,N,N-tributyl-,
 (eicoso-μ-oxoundecaoxoundecamolybdate) [μ12-
 [orthosilicato(4-)·κO:κO:κO:κO':κO
 ':κO':κO''':κO''':κO'''':κO'''']]
 tetra-μ-oxooxotungstate(4-) (4:1)

SOL 109-99-9 THF

NTE optimization study

L8 ANSWER 19 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 137:124932 CASREACT

TI Preparation of aromatic carbonates with palladium-containing long-life catalysts

IN Ban, Tetsuo; Yoshisato, Akinobu; Muramoto, Masaharu; Fujiwara, Yuzo;

Yamaji, Teizo; Chia, Cheng-Kuo; Yin, Kuo-Chuan

PA Teijin Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

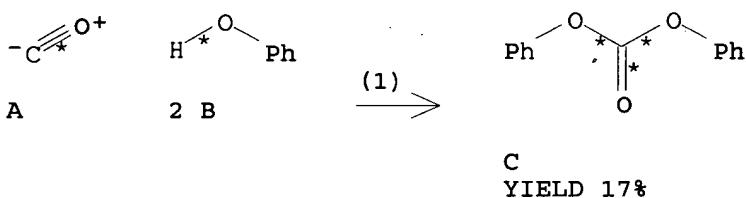
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002212141	A2	20020731	JP 2001-6118	20010115
PRAI	JP 2001-6118		20010115		

AB Aromatic carbonates are prepared by treatment of aromatic hydroxy compds. with CO and mol. O in the presence of Pd (compds.), transition metal-heteropolyacid complexes, and quaternary ammonium or phosphonium salts. Thus, PhOH was autoclaved with CO and O in the presence of Pd(OAc)₂, CeHSiMol1WO40.nH₂O, Mn(OAc)₂, Bu₄NBr, and mol. sieve at 80° for 3 h to give 13.6% di-Ph carbonate.

RX(1) OF 1 A + 2 B ==> C



C
YIELD 17%

RX(1) RCT A 630-08-0, B 108-95-2

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 3375-31-3 Pd(OAc)₂, 638-38-0 Mn(OAc)₂, 1643-19-2
 Bu₄N.Br, 358684-60-3 1-Butanaminium, N,N,N-tributyl-, cerium(3+)
 (eicosa-μ-oxoundecaoxoundecamolybdate) [μ12-[
 orthosilicato(4-)·κO:κO:κO:κO':κO
 ':κO':κO':κO':κO':κO':κO':κO'
 O'''':κO'''']]tetra-μ-oxooxotungstate (1:1:1)

NTE mol. sieve as dehydration agent

L8 ANSWER 20 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 137:20221 CASREACT

TI Preparation of aromatic carbonates with catalysts containing palladium-heteropoly acid complexes and quaternary compounds

IN Yoshisato, Akinobu; Ban, Tetsuo; Muramoto, Masaharu; Fujiwara, Yuzo;
 Yamaji, Teizo; Jia, Chengguo; Yin, Guochuan

PA Teijin Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

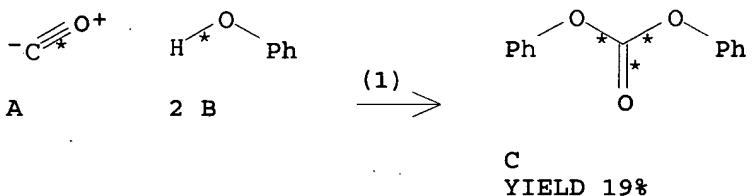
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002167359	A2	20020611	JP 2000-364632	20001130
PRAI	JP 2000-364632		20001130		

AB Aromatic carbonates, useful as materials for polycarbonates, etc., are prepared by treatment of aromatic hydroxy compds. with CO and mol. O in the presence of Pd-heteropoly acid complexes and quaternary ammonium salts and/or quaternary phosphonium compds. Thus, PhOH was autoclaved with CO and O in the presence of $(Bu_4N)_2PdSiMo_{12}O_{40} \cdot nH_2O$, $Mn(OAc)_2$, Bu_4NBr , and mol. sieve at 80° for 3 h to give 19.2% di-Ph carbonate, vs. 1.9%, without the Pd complex.

RX(1) OF 1 **A** + 2 **B** ==> **C**



RX(1) RCT A 630-08-0, B 108-95-2

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 1643-19-2 $Bu_4N.Br$, 358684-59-0 1-Butanaminium,
 N,N,N -tributyl-, palladium(2+) [μ_{12} -[orthosilicato(4-)-
 $\kappa O:\kappa O:\kappa O:\kappa O':\kappa O':\kappa O':\kappa$
 $O'':\kappa O'':\kappa O'':\kappa O'':\kappa O'':\kappa O'':\kappa O'']]t
 etracosa- μ -oxododecaoxododecamolybdate(4-) (2:1:1), 638-38-0
 $Mn(OAc)_2$$

L8 ANSWER 21 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 136:183616 CASREACT

TI Reactivation of catalysts and preparation of aromatic carbonates with the
 reactivated catalysts

IN Yoshisato, Akinobu; Muramoto, Masaharu; Ban, Tetsuo

PA Teijin Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

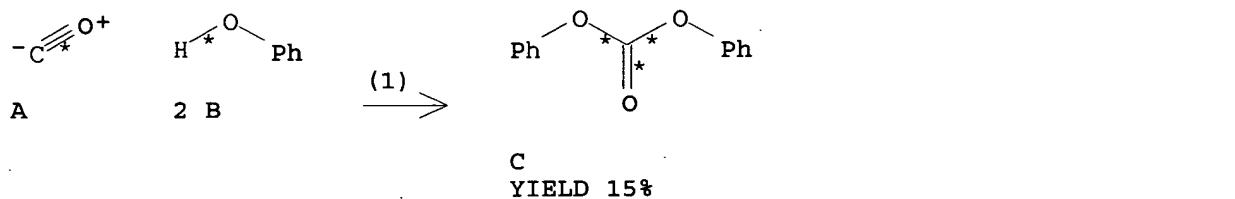
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 2002053526	A2	20020219	JP 2000-238250	20000807
PRAI JP 2000-238250		20000807		

AB Solid catalysts comprising Pt-group metals, their compds., or their complexes supported on carriers, which have been used in preparation of aromatic carbonates by treatment of aromatic hydroxy compds. with CO and O in the presence of quaternary ammonium salts or phosphonium salts and optional bases, are reactivated by treating with the aromatic hydroxy compds. (and their mixts. with organic solvents). Thus, PhOH was treated with Bu_4NBr , $Mn(II)$ acetylacetone, and Pd supported on perovskite-type $La_0.2Pb_0.8ZrO_3$ under CO and O at 80° and 10 bar for 3 h to give 15.8% di-Ph carbonate. The catalyst was recovered, washed with PhOH, and reused to show almost the same activity as the fresh catalyst.

RX(1) OF 1 **A** + 2 **B** ==> **C**



RX(1) RCT A 630-08-0, B 108-95-2
RGT D 7782-44-7 O2
PRO C 102-09-0
CAT 14024-58-9 Manganese, bis(2,4-pentanedionato-
κO,κO')-, 1643-19-2 Bu4N.Br, 7440-05-3 Pd,
398473-05-7 Lanthanum lead zirconium oxide (La0.2Pb0.8ZrO3)
NTE Pd catalyst was recovered and reactivated by washed with PhOH

L8 ANSWER 22 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 135:303680 CASREACT
TI Separation and recovery of diaryl carbonates
IN Ohashi, Kenji; Suzuki, Hirotaka; Muraoka, Takeshi; Yoshizato, Akinobu
PA Teijin Ltd., Japan
SO Jpn Kokai Tokkyo Koho 6 pp

SU JPN. KOKAI
C0DEN: JKYY

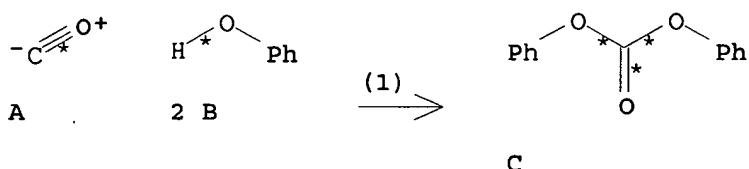
CODEN: DT Patent

DI Patent
LA Japanese

EA 8apa
EAN CNT 2

PATENT NO.		KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001288149	A2	20011016	JP 2000-106257	20000407
	WO 2001077060	A1	20011018	WO 2001-JP2925	20010404
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG					
	AU 2001046830	A5	20011023	AU 2001-46830	20010404
	EP 1270541	A1	20030102	EP 2001-919774	20010404
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	TW 524802	B	20030321	TW 2001-90108345	20010406
	US 2003162989	A1	20030828	US 2002-240927	20021007
PRAI	JP 2000-106257		20000407		
	JP 2000-106258		20000407		
	WO 2001-JP2925		20010404		
OS	MARPAT 135:303680				
AB	ROCO2R [I; R = C6-15 (un)substituted aryl], useful as materials for aromatic polycarbonates. are recovered from a mixed solution mainly containing I and ROH (R = same as above) by adding a solvent which is miscible with ROH and has solubility parameter δ_s 7.0-10.0 to the solution for selective crystallization of I. I may be prepared by oxidative carbonylation of aromatic hydroxy compds. with CO and O ₂ in the presence of catalysts. The catalysts contained in the solution after crystallization may be recycled after removal of the solvent. A				

reaction mixture, prepared by autoclaving Pd acetylacetone, PhOH, lead oxide, Mn acetylacetone, Bu4NBr, CO, and O₂, was mixed with MeOH and the mixture was cooled from 45° to 20° to give crystal containing 98.0% Ph₂CO₃.



RX(1) RCT A 630-08-0, B 108-95-2

STAGE(1)

RGT D 7782-44-7 O₂
CAT. 14024-61-4 Pd acetylacetone, 1335-25-7 Lead
oxide, 14284-89-0 Mn acetylacetone, 1643-19-2 Bu4N.Br

STAGE(2)

SOL 67-56-1 MeOH

PRO C 102-09-0

L8 ANSWER 23 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 135:303679 CASREACT
TI Preparation of aromatic carbonates using platinum-group catalysts
IN Suzuki, Hirotaka; Ohashi, Kenji; Muraoka, Takeshi; Yoshizato, Akinobu
PA Teijin Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 2

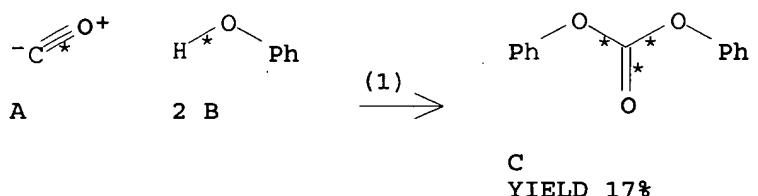
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001288148	A2	20011016	JP 2000-106258	20000407
	WO 2001077060	A1	20011018	WO 2001-JP2925	20010404
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	AU 2001046830	A5	20011023	AU 2001-46830	20010404
	EP 1270541	A1	20030102	EP 2001-919774	20010404
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
	TW 524802	B	20030321	TW 2001-90108345	20010406
	US 2003162989	A1	20030828	US 2002-240927	20021007
PRAI	JP 2000-106257		20000407		

JP 2000-106258 20000407
 WO 2001-JP2925 20010404

OS MARPAT 135:303679

AB ROCO2R [R = C6-15 (un)substituted aryl], useful as materials for aromatic polycarbonates, are prepared by (1) treating aromatic hydroxy compds. with CO and O in the presence of catalysts comprising Pt-group metals or their compds., redox agents, and quaternary ammonium salts or quaternary phosphonium salts, (2) adding solvents which are miscible with the aromatic hydroxy compds. and have solution parameter δ_s 7.0-10.0 to the reaction mixture mainly containing the aromatic carbonates and the aromatic hydroxy compds. to selectively crystallize the carbonates, and (3) removing the solvents from the catalyst-containing solution after removal of the crystal for recycling of the catalysts. A mixture of Pd acetylacetone, PhOH, lead oxide, Mn acetylacetone, and Bu4NBr was autoclaved at 80° while bubbling with CO and O for 3 h to give 17.9% (based on PhOH) Ph2CO2. A part of the reaction mixture was mixed with MeOH, cooled from 45° to 20°, and filtered to give crystal containing slight Mn and Pb and recover 99.0% catalyst and 97.2% PhOH.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2

RCT D 7782-44-7 O2

PRO C 102-09-0

CAT 14024-61-4 Pd acetylacetone, 14284-89-0 Mn acetylacetone, 1335-25-7 Lead oxide, 1643-19-2 Bu4N.Br

L8 ANSWER 24 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 135:241986 CASREACT

TI Oxidative carbonylation of phenol to diphenyl carbonate catalyzed by bis(benzonitrile)dichloropalladium in the presence of polyvinylpyrrolidone

AU Ishii, Hirotoshi; Ueda, Mitsuru; Takeuchi, Kazuhiko; Asai, Michihiko

CS Joint Research Center for Precision Polymerization (JRCPP)-Tsukuba, NIMC, Japan Chemical Innovation Institute (JCII), Tsukuba, 305-8565, Japan

SO Catalysis Communications (2001), 2(1), 17-22

CODEN: CCAOAC; ISSN: 1566-7367

PB Elsevier Science B.V.

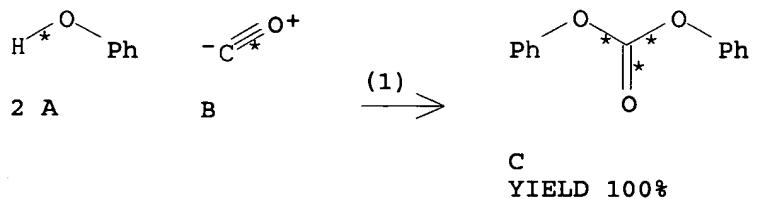
DT Journal

LA English

AB Pd(PhCN)2Cl2 [bis(benzonitrile)dichloropalladium] was investigated in the presence of polyvinylpyrrolidone (PVP) as a polymer support for the direct synthesis of di-Ph carbonate (DPC) by oxidative carbonylation of phenol using carbon monoxide (CO) and air. Pd(PhCN)2Cl2 was found to be more efficient than the conventional PdBr2 system, and its efficiency was enhanced in the presence of high mol. weight PVP with MW = 360,000 and 1,300,000. The best efficiency of Pd(PhCN)2Cl2/Mn(TMHD)3 [tris(2,2,6,6-tetramethyl-3,5-heptanedionato)manganese]/(Ph3P=)2NBr [bis(triphenylphosphoranylidene)ammonium bromide] system was obtained by

using 0.241 mmol of PVP with MW = 360,000 where TOF (turnover frequency) reached 11.31 (mol-DPC/mol-Pd h, Pd/Mn/Br/phenol = 1/2/20/2667; CO 0.50 MPa; air 0.25 MPa, 100°, 3 h).

RX(1) OF 2 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 9003-39-8 2-Pyrrolidinone, 1-ethenyl-, homopolymer,
14220-64-5 PdCl₂(PhCN)₂, 14324-99-3 Manganese,
tris(2,2,6,6-tetramethyl-3,5-heptanedionato- κ O, κ O')-
, (OC-6-11)-, 20545-30-6 Phosphorus(1+), triphenyl(P,P,P-
triphenylphosphine imidato- κ N)-, bromide, (T-4)-

NTE optimized on catalyst

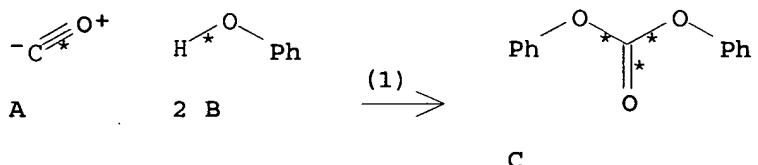
RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 25 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 135:195420 CASREACT
TI Preparation of aromatic carbonates or aliphatic carbonates
IN Ishii, Kouju; Goyal, Minakusi; Ueda, Mitsuru; Takeuchi, Kazuhiko; Asai,
Michihiko
PA Kagaku Gijitsu Senryakusuushin Kiko, Japan; Ministry of Economy, Trade and
Industry; National Industrial Research Institute
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001233830	A2	20010828	JP 2000-51212	20000228
PRAI JP 2000-51212		20000228		

AB Title compds. are prepared by reaction of aromatic or aliphatic hydroxy compds. with CO and O in the presence of supported catalyst compns. having \geq 1 compds. selected from organic metal complexes, compds. having redox catalytic activity, and compds. activating the hydroxy compds. PhOH was reacted with CO and O in the presence of manganese (2,2,6,6-tetramethyl-3,5-heptanedionato)3, bis(triphenylphosphoranylidene)ammonium bromide, and catalyst [prepared by treating PPh₃-bonded styrene-divinylbenzene copolymer with dichlorobis(benzonitrile)palladium] at 100° for 3 h to give 0.60% di-Ph carbonate.

RX(1) OF 2 A + 2 B ==> C

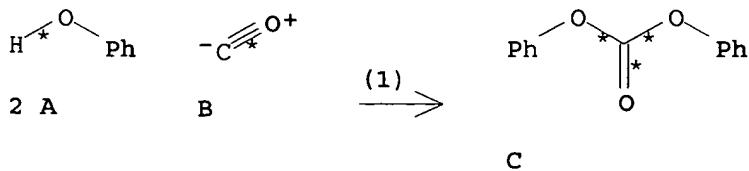


RX(1) RCT A 630-08-0, B 108-95-2
RGT D 7782-44-7 O2
PRO C 102-09-0
CAT 603-35-0 PPh₃, 9003-70-7 Polysorb 1, 14220-64-5
PdCl₂(PhCN)₂, 14324-99-3 Manganese, tris(2,2,6,6-tetramethyl-3,5-heptanedionato-κO,κO')-, (OC-6-11)-, 20545-30-6
Phosphorus(1+), triphenyl(P,P,P-triphenylphosphine imidato-κN)-, bromide, (T-4)-

L8 ANSWER 26 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 134:207611 CASREACT
 TI Carbonylation catalyst composition and method for producing diaryl
 carbonates from hydroxyaromatic compounds
 IN Johnson, Bruce Fletcher; Shalyaev, Kirill Vladirimovich; Soloveichik,
 Grigorii Lev; Pressman, Eric James
 PA General Electric Company, USA
 SO PCT Int. Appl., 14 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001016086	A1	20010308	WO 2000-US20624	20000728
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6215014	B1	20010410	US 1999-383424	19990827
	EP 1212286	A1	20020612	EP 2000-952269	20000728
	EP 1212286	B1	20040204		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL				
	JP 2003508375	T2	20030304	JP 2001-519656	20000728
	AT 258913	E	20040215	AT 2000-952269	20000728
	US 6265340	B1	20010724	US 2000-699005	20001030
PRAI	US 1999-383424		19990827		
	WO 2000-US20624		20000728		
AB	Hydroxyarom. compds., such as phenol, are carbonylated with oxygen and carbon monoxide into diaryl carbonates, such as di-Ph carbonate, in the presence of a catalyst system comprising: a Group VIIIB metal, preferably palladium; an alkali metal or alkaline earth metal halide, preferably sodium bromide; and at least one sulfone, such as sulfolane. The catalyst system also preferably contains a compound of another metal, preferably lead.				

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 14024-61-4 Pd acetylacetone, 15282-88-9 Lead,
bis(2,4-pentanedionato- κ O, κ O')-, (T-4)-, 7647-15-6
NaBr, 126-33-0 Sulfolane

SOL 111-96-6 (MeOCH2CH2)2O

NTE other cocatalysts also used

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 27 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 134:115760 CASREACT

TI Carbonylation catalyst composition and method for producing diaryl carbonates from hydroxyaromatic compounds using carboxamides as catalyst promoters

IN Johnson, Bruce Fletcher; Soloveichik, Grigorii Lev; Pressman, Eric James;
Shalyaev, Kirill Vladimirovich

PA General Electric Company, USA

SO U.S., 4 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6180812	B1	20010130	US 1999-383426	19990827
	WO 2001016088	A1	20010308	WO 2000-US21581	20000808
	W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	EP 1212288	A1	20020612	EP 2000-952620	20000808
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL			
	JP 2003508377	T2	20030304	JP 2001-519658	20000808
	US 6346499	B1	20020212	US 2000-686741	20001011

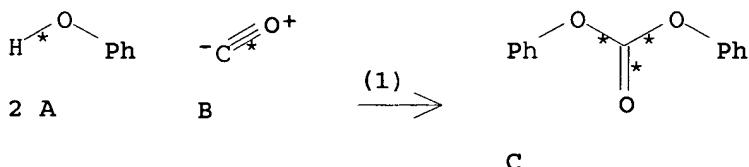
PRAI US 1999-383426 19990827

WO 2000-US21581 20000808

AB A method for preparing a diaryl carbonate (e.g., di-Ph carbonate) is presented which comprises contacting at least one hydroxyarom. compound (e.g., phenol) with oxygen and carbon monoxide in the presence of a catalytic composition comprising: (A) a Group VIII metal having an atomic number of

≥ 44 or a compound of it; (B) at least one Group IA or IIA halide; (C) at least one carboxamide; and (D) at least one cocatalyst which is a compound of copper, titanium in combination with zinc, copper or lead, or cerium in combination with lead or manganese.

RX(1) OF 1 2 A + B ==> C

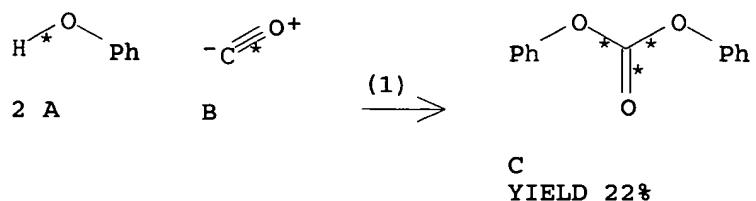


RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 872-50-4 NMEP,
 7647-15-6 NaBr, 13395-16-9 Cu acetylacetone
 SOL 108-95-2 PhOH
 NTE other co-catalysts such as titanium in combination with zinc,
 copper or lead, or cerium in combination with lead or manganese
 may be used

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 28 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 133:4482 CASREACT
 TI Oxidative carbonylation of phenol to diphenyl carbonate over supported palladium catalysts
 AU Song, H. Y.; Park, E. D.; Lee, J. S.
 CS Department of Chemical Engineering and School of Environmental Engineering, Pohang University of Science and Technology (POSTECH), Pohang, S. Korea
 SO Journal of Molecular Catalysis A: Chemical (2000), 154(1-2), 243-250
 CODEN: JMCCF2; ISSN: 1381-1169
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Oxidative carbonylation of phenol to form di-Ph carbonate (DPC) was investigated in the multi-step electron transfer system containing homogeneous or heterogeneous palladium as the main component. Carbon-supported Pd catalyst showed a better DPC yield than the best homogeneous system with Pd(OAc)₂ for the same amount of palladium. For the supported palladium catalyst, the hydrophobicity of the supports appeared to be critical for high yields of DPC. The palladium remained in the metallic state and dissoln. into the reaction solution was, if there was any, negligible. Effects of promoters in carbon-supported Pd catalyst system were also examined

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2

STAGE(1)

RGT D 1643-19-2 Bu4N.Br
 CAT 7440-05-3 Pd, 71-48-7 Co(OAc)2
 SOL 106-51-4 p-Benzoquinone

STAGE(2)

RCT B 630-08-0

STAGE(3)

RGT E 7782-44-7 O2

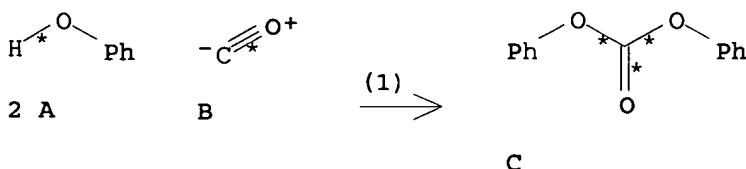
PRO C 102-09-0

NTE thermal, optimization study

RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 29 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 132:194174 CASREACT
 TI Oxidative carbonylation of phenol to diphenyl carbonate catalyzed by Pd dinuclear complex bridged with pyridylphosphine ligand
 AU Ishii, H.; Goyal, M.; Ueda, M.; Takeuchi, K.; Asai, M.
 CS NIMC, Joint Research Center for Precision Polymerization (JRCPP)-Tsukuba,
 Japan Chemical Innovation Institute (JCII), Tsukuba, Ibaraki, Japan
 SO Journal of Molecular Catalysis A: Chemical (1999), 148(1-2), 289-293
 CODEN: JMCCF2; ISSN: 1381-1169
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB Pd dinuclear complexes bridged with pyridylphosphine ligand such as Pd₂(Ph₂PPy)₂X₂ (Ph₂PPy: diphenyl-2-pyridylphosphine, X: Cl, Br, I, OCN, SCN, NO₂, N₃) were investigated as catalysts for direct synthesis of di-Ph carbonate (DPC) by oxidative carbonylation of phenol using carbon monoxide (CO) and air. Pd₂(Ph₂PPy)₂X₂/redox catalyst/ammonium halide system were found to be more effective than not only conventional PdBr₂/Ce(Trop)₄ (Trop: tropolonate)/(Ph₃P:)₂NBr (bis(triphenylphosphoranylidene)ammonium bromide) system but Pd₂(dpm)₂X₂ (dpm: bis(diphenylphosphino)methane)/Mn(TMHD)₃ (TMHD: 2,2,6,6-tetramethyl-3,5-heptanedionate)/(Ph₃P:)₂NBr system too. The best efficiency was obtained by using Pd₂(Ph₂PPy)₂(NO₂)₂/Ce(TMHD)₄/(Ph₃P:)₂NBr system where TOF reached 19.21 (mol-DPC/mol-Pd h).

RX(1) OF 1 2 A + B ==> C



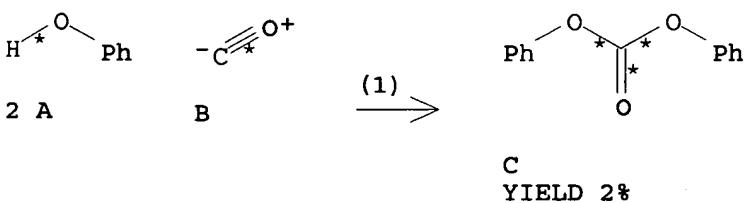
RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 260251-60-3 Palladium, bis[μ-[2-(diphenylphosphino-κP)pyridine-κN]]bis(nitrito-κN)di-, (Pd-Pd), 18960-54-8 Cerium, tetrakis(2,2,6,6-tetramethyl-3,5-heptanedionato-κO,κO')-, (SA-8-11''11''1'1'''1'1''')-, 20545-30-6 Phosphorus(1+), triphenyl(P,P,P-triphenylphosphine imidato-κN)-, bromide, (T-4)-
 NTE optimizing prepn. of product on catalyst system
 RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 30 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 132:166014 CASREACT
 TI Preparation of aromatic carbonates
 IN Ishii, Hirotoshi; Ueda, Mitsuru; Takeuchi, Kazuhiko; Asai, Michihiko
 PA Zaidan Hojin Kagaku Gijutsu Senryakusuishin Kiko, Japan; Agency of Industrial Sciences and Technology
 SO Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000063333	A2	20000229	JP 1998-232507	19980819
PRAI JP 1998-232507		19980819		

AB Title compds. are prepared by reaction of aromatic hydroxy compds. with CO and O in the presence of polynuclear complexes having plural Pd as central metal and redox catalysts. Phenol was reacted with CO in the presence of dichlorobis[methylenebis(diphenylphosphine)]palladium and Mn tri(2,2,6,6-tetramethyl-3,5-heptanedionate) at 100° under air for 3 h to give 1.28% di-Ph carbonate.

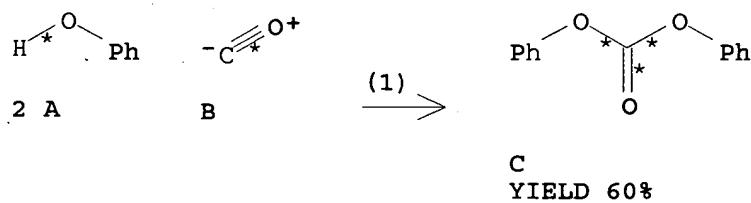
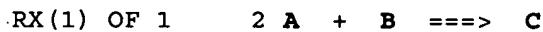
RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0

RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 68079-57-2 Palladium, bis(cyanato- κ N)bis[μ -methylenebis[diphenylphosphine- κ P]]di-, (Pd-Pd), 14324-99-3 Manganese, tris(2,2,6,6-tetramethyl-3,5-heptanedionato- κ O, κ O')-, (OC-6-11)-, 20545-30-6 Phosphorus(1+), triphenyl(P,P,P-triphenylphosphine imidato- κ N)-, bromide, (T-4)-
 NTE 100° and pressure 0.75 MPa for 3 h; product formation rate 7.66 mol/mol-Pd.h

L8 ANSWER 31 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 130:139122 CASREACT
 TI Direct synthesis of diphenyl carbonate by oxidative carbonylation of phenol using Pd-Cu based redox catalyst system
 AU Goyal, Meenakshi; Nagahata, Ritsuko; Sugiyama, Jun-ichi; Asai, Michihiko; Ueda, Mitsuru; Takeuchi, Kazuhiko
 CS Joint Research Centre for Precision Polymerization-Tsukuba, Tsukuba, Ibaraki, 305-8565, Japan
 SO Journal of Molecular Catalysis A: Chemical (1999), 137(1-3), 147-154
 CODEN: JMCCF2; ISSN: 1381-1169
 PB Elsevier Science B.V.
 DT Journal
 LA English
 AB A catalyst system was designed for direct synthesis of di-Ph carbonate by oxidative carbonylation of phenol. Besides Pd carbonylation catalyst, inorg. and organic redox cocatalysts were included in the catalyst system for in situ regeneration of active Pd species. Copper(II) acetate was used as inorg. redox cocatalyst and hydroquinone gave good results as organic redox cocatalyst. Efficiency of various bases, effect of a drying agent, and optimum reaction conditions for achieving high catalytic activity were also investigated in detail. Using suitable components of catalyst system and under optimum reaction conditions, a Pd turnover number of 250 could be obtained.

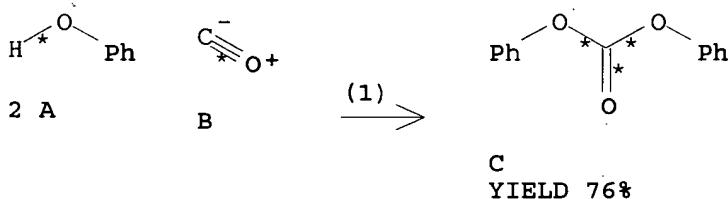


RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 43732-38-3 Palladium, bromocarbonyl-, 142-71-2 Cu(OAc)₂, 123-31-9 Hydroquinone, 1643-19-2 Bu4N.Br
 SOL 75-09-2 CH₂Cl₂
 NTE mol. sieves

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 32 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 129:316004 CASREACT
 TI Effect of inorganic redox cocatalyst on Pd-catalyzed oxidative carbonylation of phenol for direct synthesis of diphenyl carbonate
 AU Goyal, Meenakshi; Nagahata, Ritsuko; Sugiyama, Jun-ichi; Asai, Michihiko; Ueda, Mitsuru; Takeuchi, Kazuhiko
 CS Joint Research Centre for Precision Polymerization-Tsukuba, Tsukuba, Ibaraki, 305-8565, Japan
 SO Catalysis Letters (1998), 54(1,2), 29-31
 CODEN: CALEER; ISSN: 1011-372X
 PB Baltzer Science Publishers
 DT Journal
 LA English
 AB A catalyst system for direct synthesis of di-Ph carbonate (DPC) by oxidative carbonylation of phenol was investigated with special emphasis on the inorg. redox cocatalyst component. Besides the inorg. redox cocatalyst, the catalyst system was composed of a Pd carbonylation catalyst, an organic redox cocatalyst, a base and a drying agent. Ce(OAc)₃·H₂O was found to be the most efficient inorg. redox cocatalyst giving DPC in 76% yield with a Pd turnover number of 250 and without producing any major side products.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O₂, E 1643-19-2 Bu₄N.Br, F 123-31-9
 Hydroquinone
 PRO C 102-09-0
 CAT 7647-10-1 PdCl₂, 537-00-8 Acetic acid, cerium(3+) salt
 SOL 75-09-2 CH₂Cl₂
 NTE high pressure, studying effect of inorg. co-catalysts, preferred catalyst shown

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

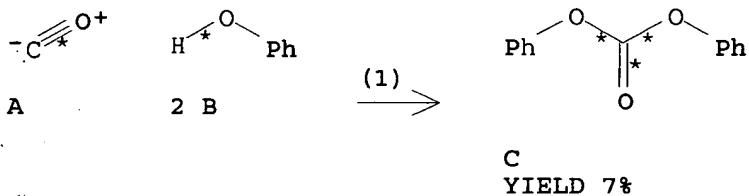
L8 ANSWER 33 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 129:67601 CASREACT
 TI Preparation of aromatic carbonic acid esters
 IN Yoneyama, Takahiro; Kujira, Katsufumi; Takagi, Masatoshi; Ootaki, Yuji
 PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 10158221	A2	19980616	JP 1996-322769	19961203

PRAI JP 1996-322769 19961203

AB Title compds., useful as materials for polycarbonates, are prepared by reaction of aromatic hydroxy compds. with CO and O in the presence of (A) Pd and/or Pd compds., (B) ≥ 1 Pb compds., (C) ≥ 1 Mn compds., (D) ≥ 1 Co compds., and (E) ≥ 1 halides. PhOH was treated with Pd(OAc)₂, PbO, Mn(OAc)₂·4H₂O, Co(OAc)₂·4H₂O, and Me₄NBr under O and air at 100° for 2 h to give 3.8% CO(OPh)₂.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 3375-31-3 Pd(OAc)₂, 1317-36-8 PbO, 638-38-0 Mn(OAc)₂,
 71-48-7 Co(OAc)₂, 64-20-0 Me₄N.Br
 SOL 98-95-3 PhNO₂

L8 ANSWER 34 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 128:167262 CASREACT

TI Preparation of aromatic carbonates from phenols

IN Yoshisato, Akinobu

PA Teijin Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

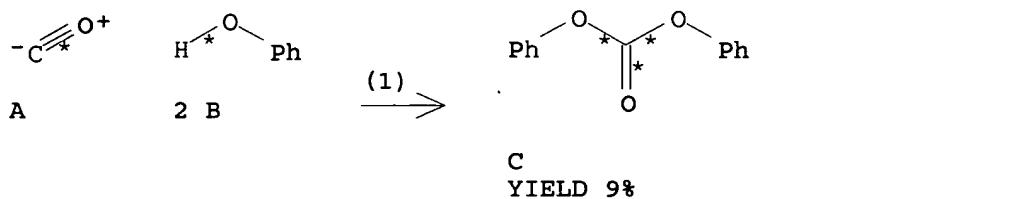
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 10045677	A2	19980217	JP 1996-204738	19960802

PRAI JP 1996-204738 19960802

OS MARPAT 128:167262

AB Aromatic carbonates are prepared from aromatic hydroxy compds., CO, and O under gas flow with constant CO and O partial pressure and total pressure in the presence of catalysts containing Pd (compds.), Ce(III) or Ce(IV) compds., and quaternary ammonium or phosphonium salts. PhOH was treated with CO and air in the presence of Pd acetylacetone, Ce acetylacetone, and Bu₄NBr at 100° under 30 kg/cm² for 3 h to give 9.1% Ph₂CO₃.

RX(1) OF 1 A + 2 B ==> C



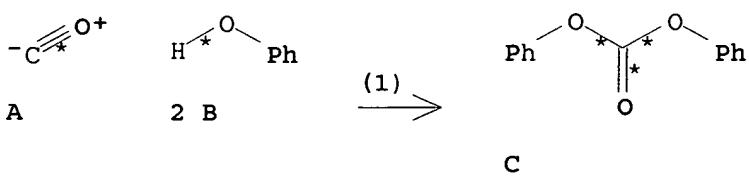
RX(1) RCT A 630-08-0, B 108-95-2
RGT D 7782-44-7 O2
PRO C 102-09-0
CAT 14024-61-4 Pd acetylacetonate, 15653-01-7 Cerium,
tris(2,4-pentanedionato- κ O, κ O')-, (OC-6-11)-,
1643-19-2 Bu4N.Br

L8 ANSWER 35 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
AN 128:75187 CASREACT
TI Preparation of aromatic carbonates by carbonylation of aromatic hydroxy compounds
IN Yoshisato, Akinobu
PA Teijin Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10001459	A2	19980106	JP 1996-154077	19960614
PRAI	JP 1996-154077		19960614		
AB	Aromatic carbonates are prepared by reaction of aromatic hydroxy compds. with CO and O in the presence of catalysts containing (a) Ru and/or Ru compds., (b) ≥1 trivalent and/or tetravalent Ce compds., and (c) tertiary ammonium salts and/or tertiary phosphonium salts. PhOH was treated with Ru acetylacetone and Ce acetylacetone trihydrate and Bu ₄ N ⁺ Br ⁻ feeding CO and air into a reactor at 100° under 30 kg/cm ² for 3 h to give 2.9% (PhO) ₂ CO.				

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
RGT D 7782-44-7 O2
PRO C 102-09-0
CAT 14284-93-6 Ruthenium, tris(2,4-pentanedionato-
κO,κO')-, (OC-6-11)-, 15653-01-7 Cerium,
tris(2,4-pentanedionato-κO,κO')-, (OC-6-11)-,

1643-19-2 Bu4N.Br

L8 ANSWER 36 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 127:346194 CASREACT
 TI Preparation of aromatic carbonates as materials for polycarbonates.
 IN Yoneyama, Takahiro; Kujira, Katsufumi; Takagi, Masatoshi; Okago, Yuji
 PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

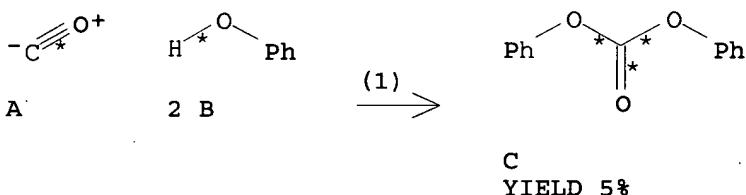
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09278715	A2	19971028	JP 1996-93850	19960416
PRAI JP 1996-93850		19960416		

AB Aromatic carbonates are prepared by reaction of aromatic hydroxy compds. with CO and O in the presence of (A) ≥1 substances chosen from Pd and Pd compds., (B) ≥1 Pb compds., (C) ≥1 Mg compds., and (D) ≥1 halides. PhOH was treated with CO in the presence of air using Pd/C, PbO, Mn(OAc)₂.4H₂O, and Me₄NBr at 100° for 1 h to give 5.9% PhOCO₂Ph.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-05-3 Pd, 7440-44-0 Carbon, 1317-36-8 PbO,
 638-38-0 Mn(OAc)₂, 64-20-0 Me₄N.Br

L8 ANSWER 37 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 127:318711 CASREACT
 TI Preparation of aromatic carbonate esters from aromatic hydroxy compounds, carbon monoxide, and oxygen
 IN Takagi, Masatoshi; Yoneyama, Takahiro; Okago, Yuji
 PA Mitsubishi Chemical Industries Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

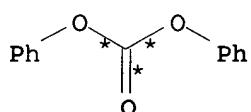
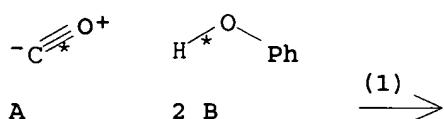
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09255629	A2	19970930	JP 1996-70457	19960326
PRAI JP 1996-70457		19960326		

AB Aromatic carbonate esters, useful as materials for polycarbonates, etc., are

prepared by treatment of aromatic hydroxy compds. with CO and O in the presence of aromatic nitro compds. PhOH was autoclaved with PhNO₂, Pd/C, PbO, CuO, and tetramethylammonium bromide at 100° for 3 h under CO and air to give 13.19% di-Ph carbonate.

RX(1) OF 1 A + 2 B ==> C

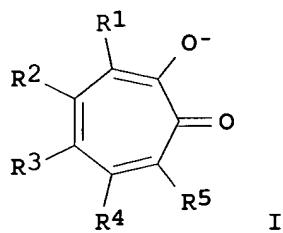


YIELD 13%

RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 98-95-3 PhNO₂, 7440-05-3 Pd, 7440-44-0 Carbon,
 1317-36-8 PbO, 1317-38-0 CuO, 64-20-0 Me4N.Br

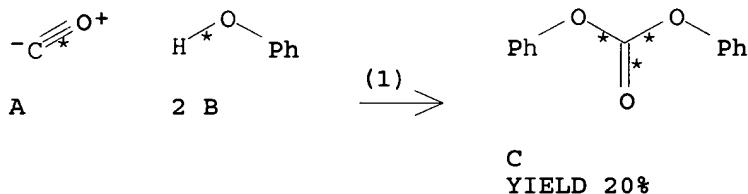
L8 ANSWER 38 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 125:247400 CASREACT
 TI Preparation of aromatic carbonate esters
 IN Ookago, Juji; Hayashi, Hideto; Myagi, Hidekazu; Kujira, Katsufumi; Takagi, Masatoshi; Suzuki, Naoki
 PA Mitsubishi Chemical Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI JP 08193056	A2	19960730	JP 1995-4382	19950113
JP 3560077	B2	20040902		
PRAI JP 1995-4382		19950113		
OS MARPAT 125:247400				
GI				



AB The title compds. are prepared by treating aromatic hydroxy compds. with CO and O in the presence of catalysts containing (A) Pd and/or Pd compds., (B) Ce compds. and/or Co compds. binding with ≥ 1 of tropolonate anions I ($R_1-5 = H, C_{1-20}$ alkyl), and (C) quaternary onium halides and/or alkali halides. Autoclaving a mixture of PhOH, Pd/C, tetrakis(tropolonate)cerium, and CsCl at 100° , 6 MPa CO, and 3 MPa air for 3 h gave 20.4% $(PhO)_2CO$.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-05-3 Pd, 7440-44-0 Carbon, 12367-89-4 Cerium,
 tetrakis[2-(hydroxy- κ O)-2,4,6-cycloheptatrien-1-onato- κ O]-, 7647-17-8 CsCl

L8 ANSWER 39 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 125:142285 CASREACT
 TI Preparation of aromatic carbonates by oxidative carbonylation of aromatic hydroxy compounds
 IN Fukuoka, Shinsuke; Ogawa, Hiroo; Watanabe, Tomoya
 PA Asahi Chemical Ind, Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF
 DT Patent
 LA Japanese

FAN.CNT 1
 PATENT NO. KIND DATE APPLICATION NO. DATE
 ----- ----- ----- ----- -----

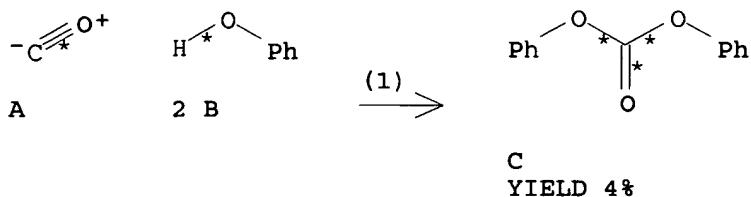
PI JP 08134022 A2 19960528 JP 1995-27704 19950125
 JP 2748242 B2 19980506

PRAI JP 1995-27704 19950125

AB Aromatic carbonates are prepared by treatment of aromatic hydroxy compds. with CO and mol. O in the presence of Pd and/or Pd compds. and alkali metal

iodides, alkaline earth metal iodides, and/or onium iodides. PhOH was autoclaved with Pd(acac)₂ and Bu₄NI under CO and air at .apprx.100° and 100 kg/cm² for 7 h to give 4.6% di-Ph carbonate.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 311-28-4 Bu₄N.I

L8 ANSWER 40 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 125:58088 CASREACT
 TI Catalytic preparation of aryl carbonates
 IN Kujira, Katsufumi; Takagi, Masatoshi; Myagi, Hidekazu; Hayashi, Hideto;
 Ookago, Juji

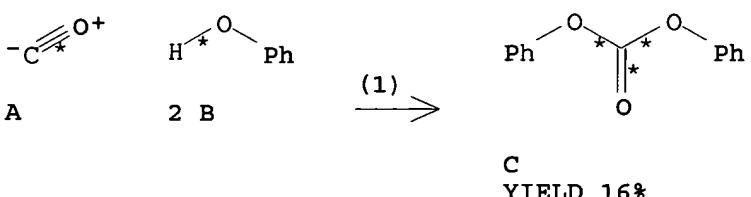
PA Mitsubishi Chemical Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF

DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08089810	A2	19960409	JP 1994-226936	19940921
PRAI	JP 1994-226936		19940921		

AB Aryl carbonates are prepared in high yield by treatment of aromatic hydroxy compds. with CO and O in the presence of (A) ≥1 selected from Pd and Pd compds., (B) ≥1 selected from Ce, Co, and Mn compds., (C) ≥1 inorg. halides selected from alkali metal and alkaline earth halides, and (D) activated C. A mixture of PhOH, PdCl₂, Ce(OAc)₃.H₂O, CsCl, and Taiko P (activated C) was autoclaved with CO (6 MPa) and dried air (3 MPa) at 100° for 3 h to give 16.46% Ph₂CO₃.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-44-0 Carbon, 7647-17-8 CsCl, 537-00-8 Acetic acid, cerium(3+) salt

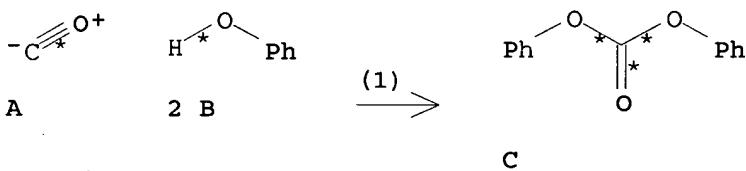
L8 ANSWER 41 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 125:33314 CASREACT
 TI Preparation of aromatic carbonate esters
 IN Kujira, Katsufumi; Takagi, Masatoshi; Myagi, Hidekazu; Hayashi, Hideto; Ookago, Juji
 PA Mitsubishi Chemical Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 08092168	A2	19960409	JP 1994-226935	19940921

PRAI JP 1994-226935 19940921

AB The title compds. are prepared by treating aromatic hydroxy compds. with CO and O using catalysts containing (A) Pd and/or Pd compds., (B) halides of alkali metal and/or alkaline earth metal, and (C) activated C. Autoclaving a mixture of PhOH, Pd acetate, CsCl, and Taiko P at 100°, 6 MPa CO, and 3 MPa O for 3 h gave 4.87% (PhO)₂CO.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7647-17-8 CsCl, 3375-31-3 Pd(OAc)₂, 7440-44-0 Carbon

L8 ANSWER 42 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 123:169244 CASREACT
 TI Process for continuous preparation of diaryl carbonates
 IN Buysch, Hans-Josef; Hesse, Carsten; Rechner, Johann; Schomaecker, Reinhard; Wagner, Paul; Kaufmann, Dieter Prof Dipl Chem
 PA Bayer A.-G., Germany
 SO Ger. Offen., 10 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 4403075	A1	19950803	DE 1994-4403075	19940202

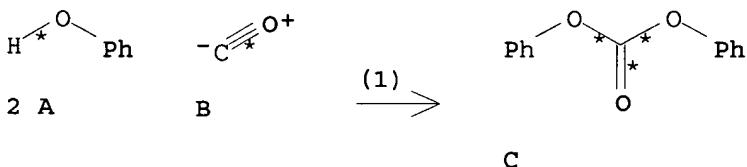
EP 667336	A1	19950816	EP 1995-100787	19950120
EP 667336	B1	19980520		
R: BE, CH, DE, ES, FR, GB, IT, LI, NL				
ES 2117808	T3	19980816	ES 1995-100787	19950120
JP 07247243	A2	19950926	JP 1995-31483	19950127
US 5498742	A	19960312	US 1995-379384	19950127
CA 2141391	AA	19950803	CA 1995-2141391	19950130
CN 1112107	A	19951122	CN 1995-101656	19950130
CN 1056365	B	20000913		

PRAI DE 1994-4403075 19940202

OS MARPAT 123:169244

AB Improvements are made in the preparation of diaryl carbonates (RO_2CO [R = (un)substituted C₆-12 aryl] by reaction of phenols ROH with CO and O₂ in the presence of a CO-activated noble metal catalyst (group VIIIB), a cocatalyst, a quaternary salt, and a base. In particular, the reaction is conducted with removal of H₂O by stripping of the reaction mixture with excess reaction gas. For example, a run was performed at 80° with 450 g PhOH, with PdBr₂ as catalyst, Mn(II) acetylacetone as cocatalyst, NaOPh as base, and in the presence of Bu₄N⁺ Br⁻. The reaction gas was a (95:5) mixture of CO and O₂ at 10 bar, introduced at a rate of 400 NL/h. The reaction mixture had a content of 18.6% (PhO_2CO after 3 h, with removal of 8.75 g PhOH-H₂O mixture as condensate. In contrast, a non-invention run using only 6 NL/h gas mixture gave only 5.4% (PhO_2CO content in 3 h, with only 0.2 g condensate.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 1643-19-2 Bu₄N.Br, E 139-02-6 NaOPh, F 7782-44-7 O₂
 PRO C 102-09-0
 CAT 13444-94-5 Palladium bromide (PdBr₂), 14024-58-9
 Manganese, bis(2,4-pentanedionato- κ O, κ O')-
 NTE 80°, with stripping of reaction water by excess reaction gas

L8 ANSWER 43 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 123:111674 CASREACT
 TI Process and catalysts for producing aromatic carbonates from aromatic hydroxy compounds

IN Takagi, Masatoshi; Miyagi, Hidekazu; Yuji, Ohgomori; Hiroshi, Iwane

PA Mitsubishi Chemical Corp., Japan

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT Patent

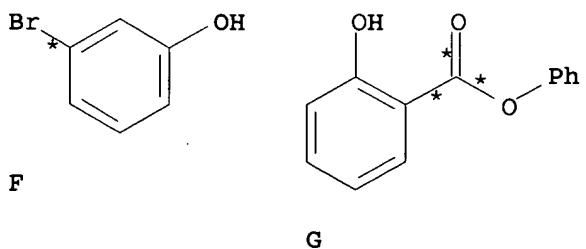
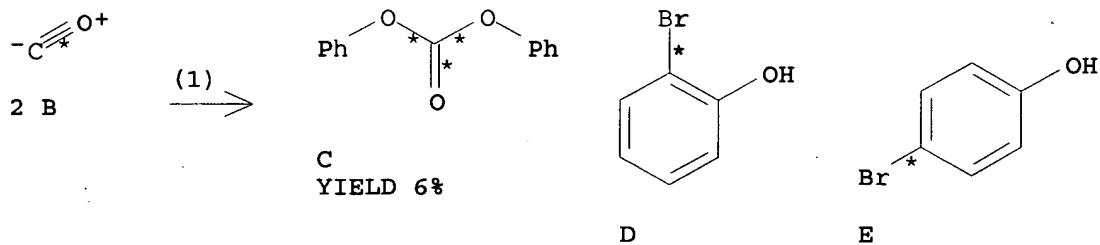
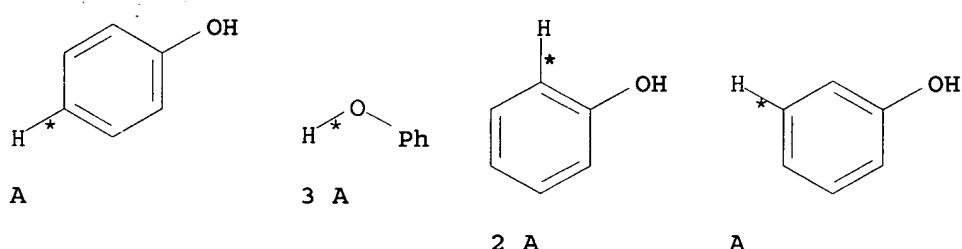
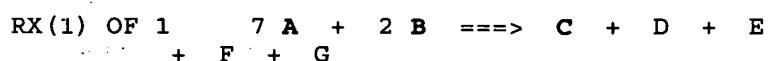
LA English

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	-----	-----	-----	-----
PI EP 663388	A1	19950719	EP 1994-118566	19941125

EP 663388	B1	19980311		
R: DE, FR, GB, IT, NL				
US 5498789	A	19960312	US 1994-348116	19941128
JP 08099935	A2	19960416	JP 1994-297211	19941130
JP 3554049	B2	20040811		
PRAI	JP 1994-1715	19940112		
	JP 1994-172695	19940725		
	JP 1994-182601	19940803		

OS MARPAT 123:111674
AB Aromatic carbonates (e.g., di-Ph carbonate) are prepared by reacting an aromatic hydroxy compound (e.g., PhOH), CO₂, and O₂ in the presence of a catalyst system comprising: (A) ≥1 of Pd and/or Pd compds. [e.g., Pd(OAc)₂], (B) ≥1 Pb compound (e.g., PbO₂), (C) ≥1 halide selected from quaternary ammonium halides (e.g., Bu₄NBr) and quaternary phosphonium halides, and, optionally, (D) ≥1 Cu compound and/or Cu. This process increases the aromatic carbonate yield per Pd turnover and suppresses the formation of aryl o-hydroxyvarom. carbonate byproducts.



RX(1) RCT A 108-95-2, B 630-08-0
 RGT H 7782-44-7 O2
 PRO C 102-09-0, D 95-56-7, E 106-41-2, F 591-20-8, G
 118-55-8
 CAT 3375-31-3 Pd(OAc)2, 1309-60-0 PbO2, 1643-19-2 Bu4N.Br

L8 ANSWER 44 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 123:55489 CASREACT
 TI Preparation of diaryl carbonates
 IN Buysch, Hans-Josef; Dohm, Joachim; Hesse, Carsten; Rechner, Johann;
 Kaufmann, Dieter
 PA Bayer A.-G., Germany
 SO Eur. Pat. Appl., 11 pp.
 CODEN: EPXXDW

DT Patent
 LA German

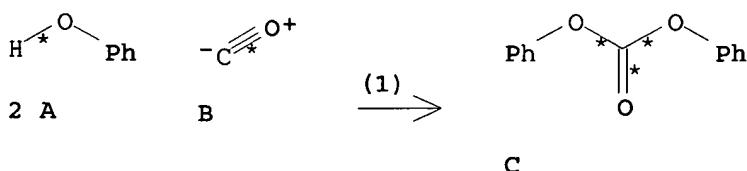
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 654461	A1	19950524	EP 1994-117665	19941109
EP 654461	B1	19971203		
R: BE, CH, DE, ES, FR, GB, IT, LI, NL				
DE 4339697	A1	19950524	DE 1993-4339697	19931122
DE 4341990	A1	19950614	DE 1993-4341990	19931209
ES 2110683	T3	19980216	ES 1994-117665	19941109
US 5502232	A	19960326	US 1994-339613	19941115
JP 07188116	A2	19950725	JP 1994-305701	19941116
CA 2135656	AA	19950523	CA 1994-2135656	19941118
CN 1107833	A	19950906	CN 1994-118957	19941122
CN 1054836	B	20000726		

PRAI DE 1993-4339697 19931122
 DE 1993-4341990 19931209

AB (RO)2CO [R = (un)substituted aryl] were prepared in a process in which an aromatic hydroxy compound is condensed with CO in the presence of O₂, a drying agent, and a catalyst system comprising a noble metal, a base, a quaternary salt, and a cocatalyst, the metal catalyst being activated by CO pretreatment in the presence of the quaternary salt and, optionally, the cocatalyst. Thus, PdBr₂ and Bu₄NBr in PhOH containing 750ppm H₂O at 55° were treated with CO after which Zeolite A, Mn(acac)₂, and pentamethylpiperidine were added and an air/CO (1:1) mixture introduced for 6h to give a mixture comprising 1.5% (PhO)₂CO.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2

STAGE(1)

RGT D 7732-18-5 Water

CAT 13444-94-5 Palladium bromide (PdBr₂), 1643-19-2

Bu4N.Br

STAGE(2)

RCT B 630-08-0

RGT E 7782-44-7 O2

CAT 14284-89-0 Mn acetylacetone, 79-55-0 Me5-piperidine

PRO C 102-09-0

NTE ZEOLITE A ALSO PRESENT IN SECOND STAGE, CATALYST ACTIVATED WITH PHENOL IN THE FIRST STAGE

L8 ANSWER 45 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 122:213737 CASREACT

TI Preparation of aromatic carbonic acid esters as materials for polycarbonates

IN Iwane, Hiroshi; Yoneyama, Takahiro; Myagi, Hidekazu

PA Mitsubishi Petrochemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

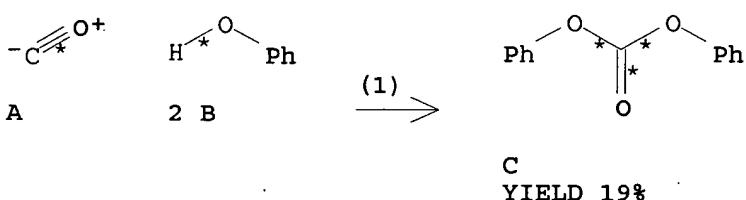
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 06271509	A2	19940927	JP 1993-62149	19930322
PRAI JP 1993-62149		19930322		

AB Aromatic carbonic acid esters, useful as materials for polycarbonates (no data), are prepared by reaction of aromatic hydroxy compds. with CO and O in the presence of Pd (compds.), Mn (compds.), Co (compds.), quaternary ammonium or phosphonium salts, and quinones or their reduction products. A mixture of PhOH, Pd/C, Mn(II) acetate, Co(II) acetate, Bu4NBr, and hydroquinone was stirred under 60 atm CO and 30 atm air at 100° for 3 h to give 19% Ph₂CO₃.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2

RGT D 7782-44-7 O2

PRO C 102-09-0

CAT 7440-05-3 Pd, 638-38-0 Mn(OAc)₂, 71-48-7 Co(OAc)₂, 1643-19-2 Bu4N.Br, 123-31-9 Hydroquinone

L8 ANSWER 46 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 122:55719 CASREACT

TI Preparation of aromatic carbonic acid esters as materials for polycarbonates

IN Iwane, Hiroshi; Yoneyama, Takahiro; Myagi, Hidekazu
 PA Mitsubishi Petrochemical Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

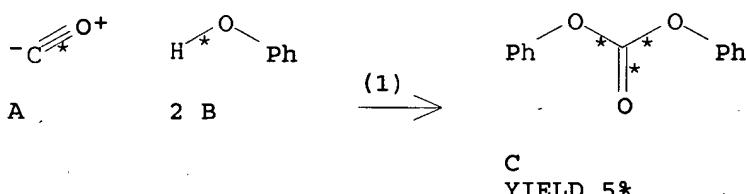
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 06271506	A2	19940927	JP 1993-56860	19930317
PRAI JP 1993-56860		19930317		

AB Aromatic carbonic acid esters, useful as materials for polycarbonates (no data), are prepared by reaction of aromatic hydroxy compds. with CO and O in presence of Pd (compds.), Mn compds., Co compds., and alkali or alkaline earth metal halides. A mixture of PhOH, Pd/C, Mn(II) acetate, Co(II) acetate, and CsBr was stirred under 60 atm CO and 30 atm air at 100° for 3 h to give 5.6% Ph₂CO₃.

RX(1) OF 1 A + 2 B ==> C



RX(1) RCT A 630-08-0, B 108-95-2
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 7440-05-3 Pd, 638-38-0 Mn(OAc)₂, 71-48-7 Co(OAc)₂,
 7787-69-1 CsBr

L8 ANSWER 47 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 120:298247 CASREACT
 TI Carbonylation process and recyclable catalysts for making aromatic carbonates

IN Pressman, Eric James; Shafer, Sheldon Jay

PA General Electric Co., USA

SO Eur. Pat. Appl., 8 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

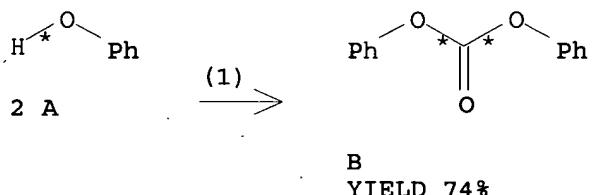
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI EP 583938	A1	19940223	EP 1993-306334	19930811
EP 583938	B1	19971105		
R: DE, ES, FR, GB, IT, NL				
US 5312955	A	19940517	US 1992-929861	19920817
ES 2108827	T3	19980101	ES 1993-306334	19930811
JP 06184057	A2	19940705	JP 1993-203054	19930817
JP 2752569	B2	19980518		

PRAI US 1992-929861 19920817

AB Aromatic organic carbonates (e.g., PhOCO₂Ph) are prepared by the carbonylation of

phenols (e.g., PhOH) at 60-150° with a mixture of O and CO in the presence of a Pd catalyst in combination with an organic catalyst, such as a terpyridine, and a Co cocatalyst in the form of a Co complex containing a pentadentate ligand. The aromatic carbonate is separated from the carbonylation reaction mixture as a 1:1 M aromatic carbonate-phenol adduct.

RX(1) OF 1 2 A ==> B



B
YIELD 74%

RX(1) RCT A 108-95-2
 RGT C 7782-44-7 O2, D 630-08-0 CO
 PRO B 102-09-0
 CAT 3375-31-3 Pd(OAc)₂, 1148-79-4
 2,2':6',2''-Terpyridine, 15391-24-9 Cobalt,
 [[2,2'-[(methylimino- κ N)bis[3,1-propanediyl(nitrilo- κ N)methylidyne]]bis[phenolato- κ O]](2-)],
 (TB-5-22), 1643-19-2 Bu4N.Br

L8 ANSWER 48 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 120:216957 CASREACT

TI Method for making aromatic carbonates via carbonylation of aromatic hydroxy compounds in presence of palladium catalyst and terpyridine cocatalyst

IN Pressman, Eric J.; King, Joseph A., Jr.

PA General Electric Co., USA

SO U.S., 5 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

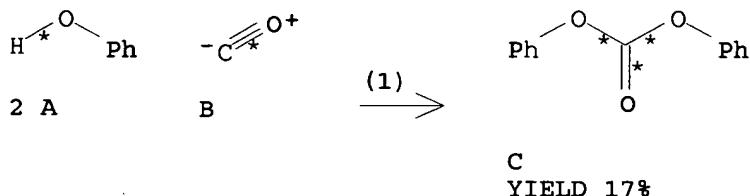
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5284964	A	19940208	US 1992-929862	19920817
	EP 583937	A1	19940223	EP 1993-306333	19930811
	EP 583937	B1	19970122		
	R: DE, ES, FR, GB, IT, NL				
	ES 2097455	T3	19970401	ES 1993-306333	19930811
	JP 06172269	A2	19940621	JP 1993-202162	19930816
	JP 2752568	B2	19980518		

PRAI US 1992-929862 19920817

AB A method is provided for making aromatic carbonates, such as di-Ph carbonate by the carbonylation of an aromatic hydroxy compound, such as phenol in the presence of a palladium catalyst and an organic cocatalyst, such as a terpyridine compound. Thus, carbonylation of PhOH with CO/O₂ in presence of [Bu₄NBr + Pd(OAc)₂ + Co(OAc)₂ + 2,2':6,2''-terpyridine, with 0.5 molar ratio of terpyridine/Pd] (catalyst system I) at 100° afforded 17.03% di-Ph carbonate after 7 h, vs. 9.7% di-Ph carbonate after 7 h using benzoquinone cocatalyst, with 12.5 molar ratio benzoquinone/Pd. Use of catalyst system I together with activated mol. sieves afforded 63.34% di-Ph

carbonate after 7 h at 115°.

RX(1) OF 3 2 A + B ==> C

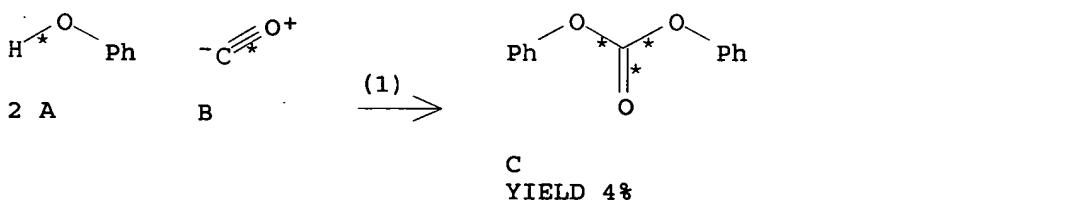


RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 1643-19-2 Bu4N.Br, 3375-31-3 Pd(OAc)2, 71-48-7
 Co(OAc)2, 1148-79-4 2,2':6',2''-Terpyridine

L8 ANSWER 49 OF 51 CASREACT COPYRIGHT 2005 ACS on STN
 AN 120:191360 CASREACT
 TI Preparation of aromatic carbonic acid esters
 IN Iwane, Hiroshi; Myagi, Hidekazu; Imada, Satoshi; Seo, Shoichi; Yoneyama, Takahiro
 PA Mitsubishi Petrochemical Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06009505	A2	19940118	JP 1992-161180	19920619
	JP 3128329	B2	20010129		
PRAI	JP 1992-161180		19920619		
AB	Aromatic carbonic acid esters are prepared by reaction of aromatic hydroxy compds., CO, and O in the presence of catalysts (A) ≥1 Pd and Pd compds., (B) ≥1 Ce(III) and Ce(IV) compds., (C) ≥1 quaternary ammonium and phosphonium salts, and (D) ≥1 quinone and its reduced products, aromatic diols. This process suppresses the formation of oxidative dimerization and trimerization byproducts such as p-phenoxyphenol which has a b.p. close to that of (PhO)2CO and is difficult to sep., and gives the desired products in high yields. Thus, 7.8 g phenol, Pd(OAc)2 2.4, Ce(OAc)3·H2O 3.5, Bu4NBr 202, and hydroquinone 34 mg were charged in a Hastelloy autoclave; after flushing the system with CO, 60 atom CO and 30 atom dry air were introduced; and the mixture was allowed to react at 120° for 1 h to give (PhO)2CO 3.7, Ph salicylate 0.12, and p-phenoxyphenol 0.039% (1.0% selectivity). Diaryl carbonates, particularly (PhO)2CO, are useful as intermediates for polycarbonates.				

RX(1) OF 2 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 3375-31-3 Pd(OAc)₂, 537-00-8 Acetic acid, cerium(3+)
 salt, 1643-19-2 Bu₄N.Br, 123-31-9 Hydroquinone
 NTE 120° in an autoclave; 60 atom CO and 30 atom air

L8 ANSWER 50 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 118:147197 CASREACT

TI Continuous preparation of aromatic carbonates

IN Fukuoka, Shinsuke

PA Asahi Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

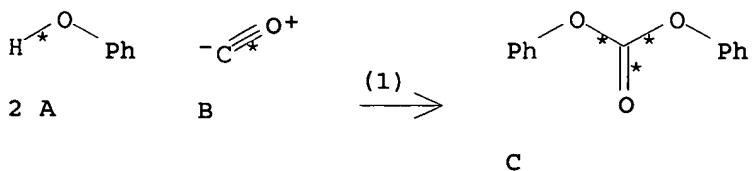
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04261142	A2	19920917	JP 1991-21086	19910214
	JP 07068181	B4	19950726		

PRAI JP 1991-21086 19910214

AB An aromatic carbonate is prepared in high yield and selectivity by reacting an aromatic hydroxy compound, CO, and mol O in the presence of a catalyst, wherein the carbonylation is carried out by (1) continuously feeding the aromatic hydroxy compound to a continuous multi-stage distillation tower, (2) taking out the down-flowing liquid from the side outlets installed at the middle and/or the lowest stage of the distillation tower, (3) introducing it to a reactor installed outside the distillation tower, (4) circulating the reaction mixture to the distillation tower through a circulation inlet installed at the stage higher than that of the side outlet, and (5) continuously taking out the byproduct H₂O as a gas from the distillation tower and the product aromatic carbonate from the bottom of the distillation tower. Thus, a preheated (180°) mixture of PhOH 92.2, Pd(acac)₂ 1.3, and Bu₄NI 6.5 weight% at 280 g/h was continuously fed into a continuous multi-stage distillation tower, taken out through 4 side outlets each connected to a reactor, reacted in the reactors at 145-150° and 75-80 kg/cm² while introducing to the bottom of each reactor a preheated gas (150°) mixture containing 75 volume% CO and 25 volume% air, and then circulated back to the distillation tower to give 63.2 g/h (PhO)₂CO with 97% selectivity (based on PhOH) from the bottom of the distillation tower.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 108-95-2, B 630-08-0
 RGT D 7782-44-7 O2
 PRO C 102-09-0
 CAT 14024-61-4 Pd acetylacetone, 311-28-4 Bu4N.I
 NTE continuous process in a distn. tower (180°) connected to
 4 reactors (145-150°), 97% selectivity

L8 ANSWER 51 OF 51 CASREACT COPYRIGHT 2005 ACS on STN

AN 115:255642 CASREACT

TI Method for making organic carbonates

IN King, Joseph Anthony, Jr.

PA General Electric Co., USA

SO Eur. Pat. Appl., 5 pp.

CODEN: EPXXDW

DT Patent

LA English

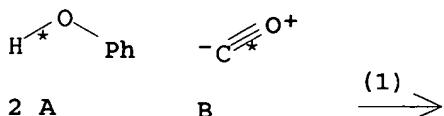
FAN.CNT 1

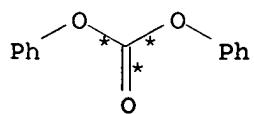
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 450442	A1	19911009	EP 1991-104643	19910325
	EP 450442	B1	19941005		
	R: DE, ES, FR, GB, IT, NL				
	CA 2034340	AA	19911003	CA 1991-2034340	19910117
	JP 04221347	A2	19920811	JP 1991-77069	19910318
	JP 06045576	B4	19940615		
	ES 2063391	T3	19950101	ES 1991-104643	19910325
	US 5132447	A	19920721	US 1991-724292	19910701

PRAI US 1990-503404 19900402

AB A method for the preparation of organic carbonates comprises the treatment of an organic hydroxy compound with CO, an oxygen-containing gas, a catalytic amount of Pd, and a desiccant amount of CO2 and stirring the mixture at 50-170° at 100-3000 psi. A reactor was charged with phenol (76.06 g), di-Ph' ether (1.896 g), benzoquinone (0.33 g), Pd(OAc)2 (0.042 g), Co(OAc)2 (0.035 g), Bu4NBr (2.49 g), CO2 (400 psi), oxygen (300 psi), and CO (600 psi) and the mixture was heated to 100°; after 3 h the reactor was recharged with oxygen and CO and the reaction was terminated after 5 h to give a 15.5% yield of di-Ph' carbonate. The presence of CO2 in the initial stage of the reaction enhanced the yield of carbonate.

RX(1) OF 1 2 A + B ==> C





C
YIELD 15%

RX(1) RCT A 108-95-2, B 630-08-0
RGT D 124-38-9 CO₂, E 1643-19-2 Bu₄N.Br, F 106-51-4 p-Benzoquinone,
G 7782-44-7 O₂, H 101-84-8 PhOPh
PRO C 102-09-0
CAT 3375-31-3 Pd(OAc)₂, 71-48-7 Co(OAc)₂

=>